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HEAVY DUTY FUEL ECONOMY PROGRAM PHASE III - TRANSIENT CYCLE EVALUATIONS OF THE ADVANCED EMISSIONS CONTROL TECHNOLOGY ENGINE

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This report describes the laboratory effort toward further evaluating the emissions and fuel economy performance of the advanced emissions control technology engine configuration optimized in Phase II of this project. An additional intent of Phase III was to obtain data toward establishing a linking mechanism between data generated previously using various different operating cycles and test procedures. Project tasks included: examination and overhaul of the engine used during Phase II, nine-mode and transient cycle emissions and fuel consumption evaluations, and recommendations for future work. For the transient cycle evaluations, which included light-duty FTP and experimental CAPE-21 cycles, the engine was installed into an appropriate heavy-duty truck. All transient cycle emissions and fuel consumption evaluations were conducted on a heavy-duty chassis dynamometer and utilized a truck-size constant volume sampler.

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PHASE III – TRANSIENT CYCLE EVAUATIONS OF THE ADVANCED EMISSIONS CONTROL TECHNOLOGY ENGINE

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This report describes the laboratory effort toward further evaluating the emissions and fuel economy performance of the advanced emissions control technology engine configuration optimized in Phase II of this project. An additional intent of Phase III was to obtain data toward establishing a linking mechanism between data generated previously using various different operating cycles and test procedures. Project tasks included: examination and overhaul of the engine used during Phase II, nine-mode and transient cycle emissions and fuel consumption evaluations, and recommendations for future work. For the transient cycle evaluations, which included light-duty FTP and experimental CAPE-21 cycles, the engine was installed into an appropriate heavy-duty truck. All transient cycle emissions and fuel consumption evaluations were conducted on a heavy-duty chassis dynamometer and utilized a truck-size constant volume sampler.

FOREWORD

This project, involving three separate phases, was initiated by the Division of Emissions Control Technology, Environmental Protection Agency, 2565 Plymouth Road, Ann Arbor, Michigan 48105. Phases I & II, which involved an analysis of heavy-duty vehicle operating data from several sources and an evaluation of emission control technology approaches, have been discussed in separate final reports (EPA-460/3-77-001 and EPA-460/3-77-010) and are only briefly summarized in this report. The Phase III evaluations, identified as Southwest Research Institute project 11-4311-002, are discussed in this report. The engineering effort on which this report is based was accomplished by the Department of Emissions Research of Southwest Research Institute, 6220 Culebra Road, San Antonio, Texas. This phase of the project, authorized by Modification 7 to Contract 68-03-2220, began on August 29, 1977, and was completed May 15, 1978.

The SwRI Project Leader was Mr. Charles Urban, who supervised all work conducted in this phase of the project. Mr. Karl Springer was Project Manager and was involved in the technical and fiscal negotiation of the initial project and this project phase.

The Project Officer for this project phase was Mr. Andrew W. Kaupert of the Technology Evaluation Staff, Environmental Protection Agency. He also served as Project Officer for the laboratory analyses and evaluations conducted in previous Phases I and II of this project.

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SUMMARY

In this project phase, the engine used in Phase II was examined and overhauled. Then nine-mode and transient cycle evaluations were conducted in the baseline and the Phase II emissions control system configurations. This emissions control system consisted of: electronic fuel injection, thermal reactors with air injection, exhaust gas recirculation, and a high energy ignition system with vacuum advance. The optimization of this system in Phase II utilized a nine-mode engine-dynamometer procedure, which involves modal conditions based on percentages of maximum power output at an engine speed of 2000 rpm.

In the examination of the Phase II engine it was found that the gaps on both compression rings were lined up on several of the pistons; resulting in longitudinal ridges on the cylinder walls. Also, there was a longitudinal groove in one cylinder wall. The high oil consumption during the latter part of the Phase II service accumulation demonstration was primarily attributed to these factors. Deposits within the intake, exhaust and combustion chamber areas were generally light to moderate. Sludge deposits were generally light and varnish deposits were generally moderate. Some structural failure occurred in the inner can of the thermal reactors. This was attributed to overheating at some undefined time during the evaluations.

Initial evaluations conducted during this project phase involved nine-mode tests on an engine dynamometer. The engine was then installed into an appropriate heavy-duty truck and nine-mode FTP, light-duty FTP, and experimental CAPE-21 cycle chassis evaluations were conducted. These evaluations involved operation of the engine in the baseline configuration and in the emission control system configuration, with and without an oxidation catalyst. These are identified as Emission Control System With Catalyst (ECSWC) and Emission Control System (ECS) in this report.

In general, significant reduction in emissions and fuel consumption were obtained with the ECS and ECSWC configurations relative to the baseline configuration. Operability over the transient cycles was essentially equal with each of the three configurations.

Relative to the baseline results, the reductions in emissions and fuel consumption with the ECS and ECSWC configurations were generally much greater in the nine-mode evaluations than in the transient cycle evaluations. In addition, with all three configurations, the relationship between the hydrocarbon, carbon monoxide and oxides of nitrogen emissions were generally different for the transient cycle results compared to the nine-mode cycle results.

This project phase has demonstrated that the Phase II emissions control system configuration also achieves a reduction of emissions and fuel consumption in transient cycle operation. The potential emissions reduction and

fuel consumption performance of the emissions control configuration has not been established since the engine was not re-optimized for transient operation. For these Phase III evaluations, the emissions control system and its calibrations were essentially unaltered from the configuration found to be satisfactory based on the steady-state testing done in Phase II of this project. In addition, there is some concern about the service life of the thermal reactors under the operating conditions utilized in this project. Therefore, additional optimization and durability effort would be required before the full potential of this type of emissions control system can be established. It appears, however, that further work would not degrade the emissions and fuel consumption performance from that reported here.

I. INTRODUCTION

This report covers evaluations conducted under Phase III of a three phase Heavy-Duty Fuel Economy Program. Phase II involved further evaluations using the emissions control engine assembled in Phase II of this project.[1]*

A. Phase III Objectives

The primary objective of this project phase was to ascertain the emissions and fuel economy benefits obtainable utilizing the emissions control engine configuration assembled in Phase II of this project. A further objective was to identify relationships between the benefits as obtained in several heavy-duty engine testing procedures utilizing both engine dynamometer and chassis dynamometer protocols.

B. Input from Phases I and II

Phase I of this project[2] was to provide the modal operating conditions for use in Phase II, which could provide definition of a specific fuel consumption (SFC) representative of fuel consumption in actual vehicle operation. The Phase I study, however, showed that there was no simple correlation between the nine-mode engine dynamometer BSFC and vehicle fuel economy, since variables such as vehicle weight and power-to-weight ratio must be considered. The correlation could not be significantly improved by change of FTP modal weighting factors or by addition of a few steady state modes. Since Phase I did not provide the anticipated input into Phase II, a recommended nine-mode procedure[3] composite SFC was selected for engine optimization.

> To the extent deemed practical, the "Recommended Heavy-Duty Gasoline Instrumentation and Test Procedures," dated July 11, 1975 was utilized throughout Phases II and III of this project. During Phase II, Proposed Rules were published in the Federal Register on May 24, 1976. During Phase III, Final Rules for the 1979 model were published on September 8, 1977. The proposed and Final Rules contain a number of calibration and procedural changes relative to the Recommended Procedure. None of these changes have any significant effect on the final emissions values.

Phase II of this project[1] involved the evaluation of a number of emission control technology approaches adapted to a Chevrolet 350 CID heavy-duty gasoline engine. The fuel and emissions control system selected for final optimization consisted of: electronic fuel injection, thermal reactors with air injection, exhaust gas recirculation and a high energy

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* Superscript numbers in parentheses refer to the List of References at the end of this report.

ignition system with vacuum advance. This system met the Phase II project goals of 6.7 g/kWh for HC plus NO_x, 33.5 g/kWh for CO and a ten percent improvement in fuel economy based on the nine-mode recommended procedure. In addition, this optimized system completed 1500 hours of service accumulation on an engine dynamometer and was subsequently determined to be driveable in a heavy-duty truck. An oxidation catalyst was included as an add-on during the last 750 hours of the service accumulation demonstration to investigate its durability.

C. Phase III Scope of Work

The scope of work in Phase III was divided into four primary tasks.

1. Task I - Overhaul the Phase II Emission Control Configured Engine

The 350 CID Chevrolet engine, equipped with the emission control technology components, was disassembled to determine and repair the cause(s) of the high oil consumption exhibited during the latter stages of Phase II testing. After documenting the condition of the engine, the engine was overhauled to manufacturer's service specifications.

2. Task II - Inspect the Emissions and Fuel Control Systems

The advanced technology components were inspected and were photographed, cleaned, and adjusted as appropriate. The condition of these components were reported to the EPA Project Officer along with recommendations for component replacement.

3. Task III - Complete the Engine Testing Program

The specified test program was then conducted with the overhauled engine. This test program involved operation on an engine dynamometer and on heavy-duty chassis dynamometers. Brake specific emissions and BSFC were measured on engine dynamometer nine-mode tests, and mass emissions, fuel economy, and continuous raw exhaust emissions were measured on the chassis dynamometer transient tests.

4. Task IV - Recommendations

Based on the findings in this project, suggestions have been made for additional work concerning the emissions control system and the test procedures.

II. EQUIPMENT, INSTRUMENTS, PREPARATIONS AND PROCEDURES

This section describes the engine, facilities, instrumentation, procedures and fuel utilized in this phase of the project.

A. Engine and Components

The Chevrolet 350-V8 heavy-duty gasoline engine utilized in this phase of the project was a 1975 model used in Series 50-60 trucks and Series 60 buses, except in California. This engine was equipped with a two-barrel carburetor and the original displacement and bore and stroke were as follows:

Displacement	5737 cc	350 cu. in
Bore & Stroke	102 x 88 mm	4.0 x 3.48 in.

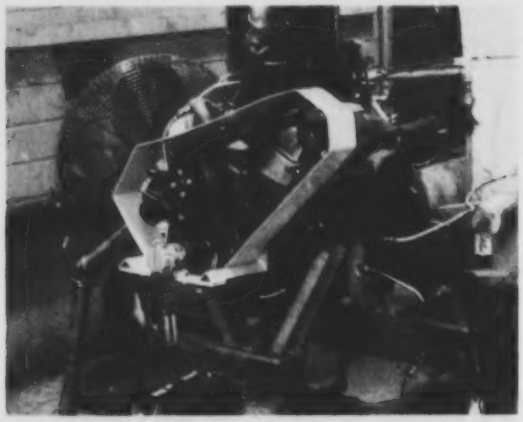
This engine was previously utilized in the Phase II evaluations and was overhauled in Task I of this project phase. Overhaul of this engine included reboring the cylinders to the standard oversize of 0.762 mm (0.030 inch). This engine and the major baseline and control system components are described in Appendix Table A-1. Views of the baseline and the emissions control configuration are shown in Figure 1.

B: Dynamometers

1. Engine Dynamometer - An Eaton Dynamatic all-electric absorbing-motoring dynamometer was used for all engine dynamometer nine-mode evaluations. This dynamometer has 373 kW (500 hp) absorbing and 149 kW (200 hp) motoring capability. This dynamometer is shown in Figure 1.

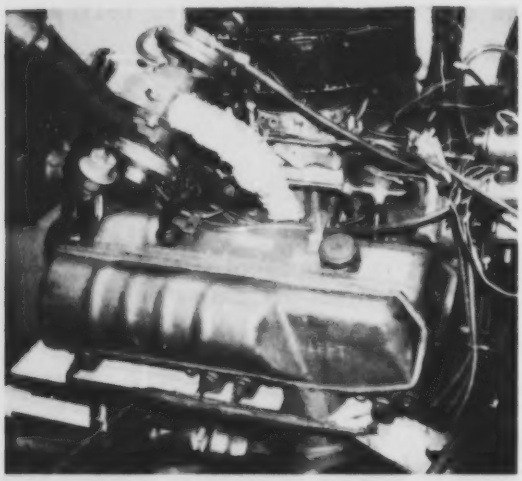
2. Chassis Dynamometer - Two chassis dynamometers were used in this project. The dynamometer used for the chassis version nine-mode tests was a Clayton CT-200 with 200 hp absorbing capability. To this was connected a 50 hp electric motor which, by means of gear belt drive, provides the 2000 ± 100 rpm engine speed required for the test. A similar dynamometer, except without the 50 hp electric motor, was used in conducting the transient cycle evaluations. The high capacity Clayton water brake dynamometers used in this project are similar to and have similar road load characteristics to those used in the car size dynamometer for light-duty testing.

A view of the truck installed on the dynamometer used during the transient driving tests is shown in Figure 1. Figure 1 also shows the inertia wheel combination used to simulate the weight of the vehicle and the railroad car brake shoes which were used to provide the additional braking capacity necessary for operation of vehicles of 7250 kg (16,000 lbs) and over. The inertia wheels were directly connected to a Clayton water brake dynamometer through the 219 mm (8.625 inch) diameter rolls. This dynamometer system had been previously utilized in evaluating the 30 trucks and buses in a previous heavy-duty vehicle emissions project.(4)

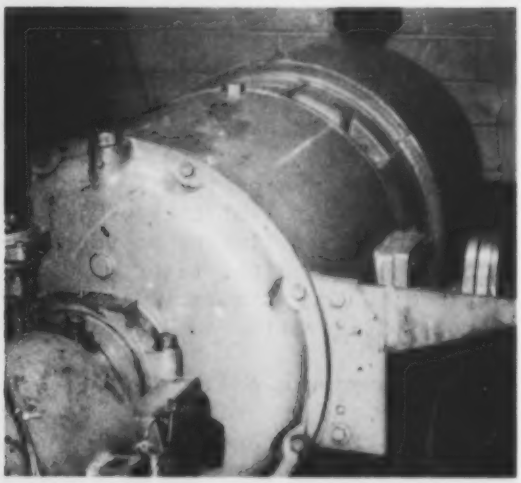


Baseline engine

Oxidation catalyst



Emissions control engine



Engine dynamometer

Truck on chassis dynamometer

Inertia wheels and brake

Figure 1. Engine and dynamometer systems used in Phase III

C. Exhaust Sampling and Analysis

Two different exhaust sampling techniques and sets of instrumentation were used in this project. One system was used for evaluating raw exhaust and the other for CVS diluted exhaust.

1. Raw Exhaust - The same system previously used in the Phase II evaluations was utilized for sampling and analysis of raw exhaust in this phase. This system, originally based on the system specified in the recommended procedure,[3] meets most of the requirements in the rules and regulations for the 1979 and later model year heavy-duty engines. This procedure requires the use of a heated flame ionization detector (FID) for measuring hydrocarbons (HC) and a chemiluminescence analyzer (CL) for measuring oxides of nitrogen (NO_x). Nondispersive infrared (NDIR) instruments are used for measuring carbon dioxide (CO_2) and carbon monoxide (CO). A schematic of the system, as specified in the recommended procedure and given as an example in the final rules, is shown in Figure 2.

This system was used for all nine-mode evaluations and for obtaining continuous recorder traces of the raw exhaust emissions during the transient cycle evaluations. To eliminate error in the CVS diluted samples, essentially all of the raw exhaust sample extracted for analysis during the chassis evaluations was returned to the exhaust system. Only the very small amount of gas sample utilized in the FID and CL instruments was not returned. The resultant error from the exhaust gas flow to these two instruments was negligible.

2. CVS Diluted Exhaust - A truck size constant volume sampler (CVS), with nominal 17 m^3/min flow capacity was used to acquire dilute samples during the evaluations on the chassis dynamometer. The diluted sample flow rates were 0.5 m^3/hr for the CAPE-21 evaluations and 0.34 m^3/hr for the 1978 Light-Duty FTP and the nine-mode FTP evaluations. The bagged CVS diluted samples were evaluated on a special instrumentation cart which is used exclusively for measurement of bagged samples. This system is maintained in strict accordance with the requirements in the Emissions Regulations for New Gasoline-Fueled Light-Duty Vehicles.[5]

D. Emissions Test Procedures

The engine dynamometer procedures included the heavy-duty nine-mode certification procedure for 1975 model heavy-duty gasoline engines (9-FTP) and the recommended nine-mode procedure (9-EPA). Procedures used on the chassis dynamometer included a chassis version of the nine-mode certification procedure (chassis nine-mode FTP), a modified light-duty CVS FTP (LD-FTP), a cold start CAPE-21 procedure (CAPE-21C) and a hot start CAPE-21 procedure (CAPE-21H).

1. Nine-Mode Evaluations - The primary differences between the nine-mode EPA and the nine-mode FTP procedures are: modes in the EPA are speci-

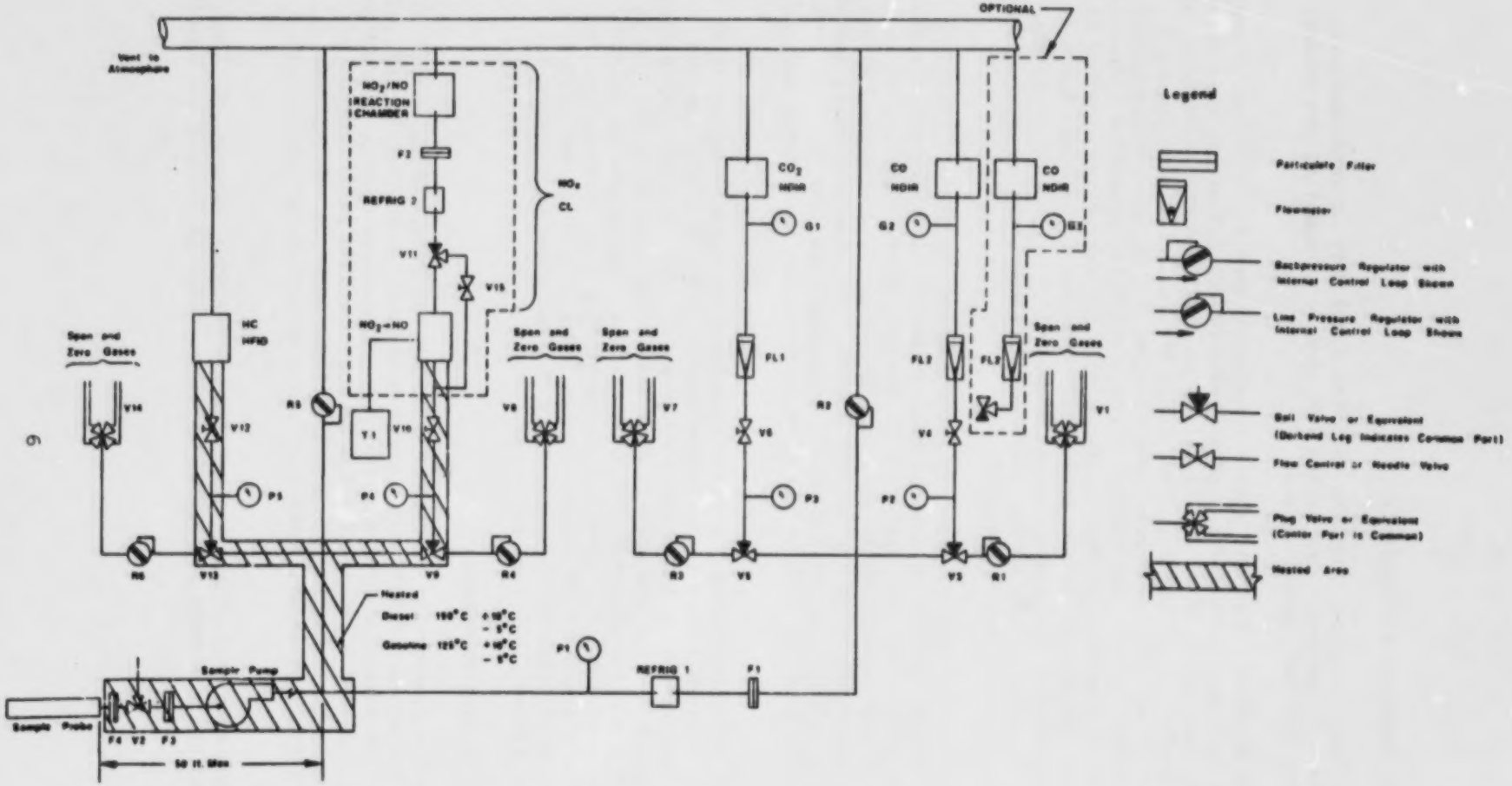


Figure 2. Heavy-duty exhaust gas sampling and analytical train

fied as various "percents of maximum torque", all modes in the EPA procedure are of one-minute duration, and the EPA procedure has only two cycles of nine-modes per test; whereas the FTP has four cycles. The nine-mode procedures are briefly described in Table 1.

The chassis version nine-mode FTP evaluations were conducted on a chassis dynamometer with the engine in the vehicle. Torque output from the engine is not measured during this type of test and the composite results are usually reported only in units of ppm or grams per minute. In this project phase, however, the torque values obtained in the engine dynamometer evaluations were utilized in calculating composite values in units of g/kWh for the chassis version evaluations. This was done to enable reporting the values in standard, familiar units. The primary reason for running the chassis version nine-mode FTP evaluations, in this project phase, was to assure that no gross change in engine operation occurred when the engine was installed in the truck.

2. Transient Chassis Evaluations - The procedures for the three transient cycles evaluated are given in Table 2 and the cycles are described in Table 3. The CAPE-21 cycles are illustrated in Figure 3. Since weighting factors were not available for the individual bags of the CAPE-21 cycles, the results for these evaluations could not be combined into composite values.

An inertia simulation of 7700 kilograms (17,000 pounds) and a power setting of 17.0 kilowatts at 64 kilometres per hour (24 horsepower at 40 mph) were used for all transient cycle operation. The 7700 kilograms inertia was the same as that used in the driveability evaluations in previous Phase II of this project. The 17.9 kilowatt power setting was determined by interpolation of power settings for Trucks 2 and 5 evaluated under previous Contract No. 68-03-2147.[4]

3. Calculation Procedures and Output Format - Test results were calculated and reduced to required units in accord with the applicable test methods. Primary exception to the preceding was the use of metric units in reporting the results (as specified in the contract). The output formats for the computer printouts of the nine-mode test data are defined in Tables A-2 and A-3 in Appendix A.

E. Fuel and Lubricant

A commercially available Gulf Crest unleaded gasoline was used throughout the Phase III evaluations. The physical properties of this gasoline (SwRI code EM-237) were as follows:

Distillation Range °C (°F)	IBP	32 (89)
	10 Pct	52 (125)
	50 Pct	103 (217)
	90 Pct	170 (338)
	EP	211 (412)

	Pct Recovered	97.9
	Pct Residue	1.3
R.V.P., kPa (pounds)		62.7 (9.10)
Gravity, g/ml (°API)		0.739 (59.9)
Lead, mg/litre (g/gallon)		<1.3 (<0.005)
Sulfur, weight percent		0.03
Hydrocarbon Composition, percent		
	Aromatics	26.4
	Olefins	2.9
	Saturates	70.7
Phosphorus, mg/litre (g/gallon)		<0.3 (<0.001)
Octane Number	Research	91.4
	Motor	84.5

The lubricant used throughout the project was Texaco Havoline SAE 30 which was designated for API service SD, SE, and CC. This lubricant met the engine manufacturer's viscosity and service specifications.

TABLE 1. DESCRIPTION OF NINE-MODE PROCEDURES

Sequence No.	Mode	Man. Vac. FTP[a]	Percent of Max. Torque EPA[b]	Time in Mode, Seconds FTP	Time in Mode, Seconds EPA	Weighting Factors, FTP & EPA
1	Idle	---	---	70	60	0.232
2	Cruise	16" Hg	25%	23	60	0.077
3	PTA	10" Hg	55%	44	60	0.147
4	Cruise	16" Hg	25%	23	60	0.077
5	PTD	19" Hg	10%	17	60	0.057
6	Cruise	16" Hg	25%	23	60	0.077
7	FL	3" Hg	90%	34	60	0.113
8	Cruise	16" Hg	25%	23	60	0.077
9	CT	---	---	43	60	0.143
	Total time per Cycle, minutes			5	9	
	Total time per Test, minutes			20	18	

[a] FTP = Certification Procedure for 1975 Model Heavy-Duty Gasoline Engines[6]

[b] EPA = Recommended Procedure for 1979 Model Heavy-Duty Gasoline Engines[3]

TABLE 2. TRANSIENT CYCLE PROCEDURES USED IN PHASE III

CAPE - 21C[7] (cold start)

- Warm-up vehicle and dynamometer, set prescribed load into the dynamometer and calibrate vehicle speed on the drivers-aid chart recorder.
- Soak vehicle at ambient temperatures between 15.6 to 26.7°C (60° - 86°F) for not less than 8 hours and not more than 36 hours.
- Run the prescribed sequence of operation for the eight individual CAPE-21C cycles.
- Calculate and report emissions and fuel consumption for each individual bag.

CAPE - 21H[7] (hot start)

- Warm-up the vehicle and dynamometer at a vehicle speed of 64 kilometers per hour (40 mph), with the dynamometer power setting specified for a minimum of 20 minutes. Then recheck the dynamometer power setting and the vehicle speed on drivers-aid and readjust if necessary.
- Shut off engine and soak for 15 minutes.
- Run the prescribed sequence of operation for the four individual CAPE-21H cycles.
- Calculate and report emissions and fuel consumption for each individual bag.

LD-FTP[5] (cold start)

- Warm-up vehicle and dynamometer, set prescribed load into the dynamometer and calibrate vehicle speed on the drivers-aid chart recorder.
- Soak the vehicle at ambient temperatures between 15.6°-26.7°C (60°-80°F) for not less than 10 hours and not more than 35 hours.
- Run the prescribed sequence of operation for the three individual cycles.
- Calculate and report emissions and fuel consumption for each individual bag and for the entire test.

TABLE 3. DESCRIPTION OF THE TRANSIENT CYCLES

CAPE - 21C [7]

Operation	Cycle Nominal Time, Sec.	Cycle Nominal Distance, km	Cycle Nominal Speed, kmh
Start engine	---	---	---
Bag 1 - LA-NF	286	1.9	23
Bag 2 - LA-F	269	5.4	72
Bag 3 - LA-NF	286	1.9	23
Bag 4 - LA-F	269	5.4	72
Bag 5 - NY-NF	254	0.9	12
Bag 6 - NY-F	281	3.4	43
Shut off engine	---	---	---
Soak 15 minutes	---	---	---
Start engine	---	---	---
Bag 7 - LA-NF	286	1.9	23
Bag 8 - LA-F	269	5.4	72

CAPE - 21H [7]

Operation	Cycle Nominal Time, Sec.	Cycle Nominal Distance, km	Cycle Nominal Speed, kmh
Start engine	---	---	---
Bag 1 - LA-NF	286	1.9	23
Bag 2 - LA-F	269	5.4	72
Bag 3 - NY-NF	254	0.9	12
Bag 4 - NY-F	281	3.4	43

LD-FTP [5]

Operation	Time, Sec.	Cycle Nominal Distance, km	Cycle Nominal Speed, kmh
Start engine	---	----	----
Bag 1 - Cold 505	505	5.78	41.2
Bag 2 - Stab. 867	867	6.29	26.1
Shut off engine	---	----	----
Soak 10 minutes	---	----	----
Start engine	---	----	----
Bag 3 -Hot 505	505	5.78	41.2

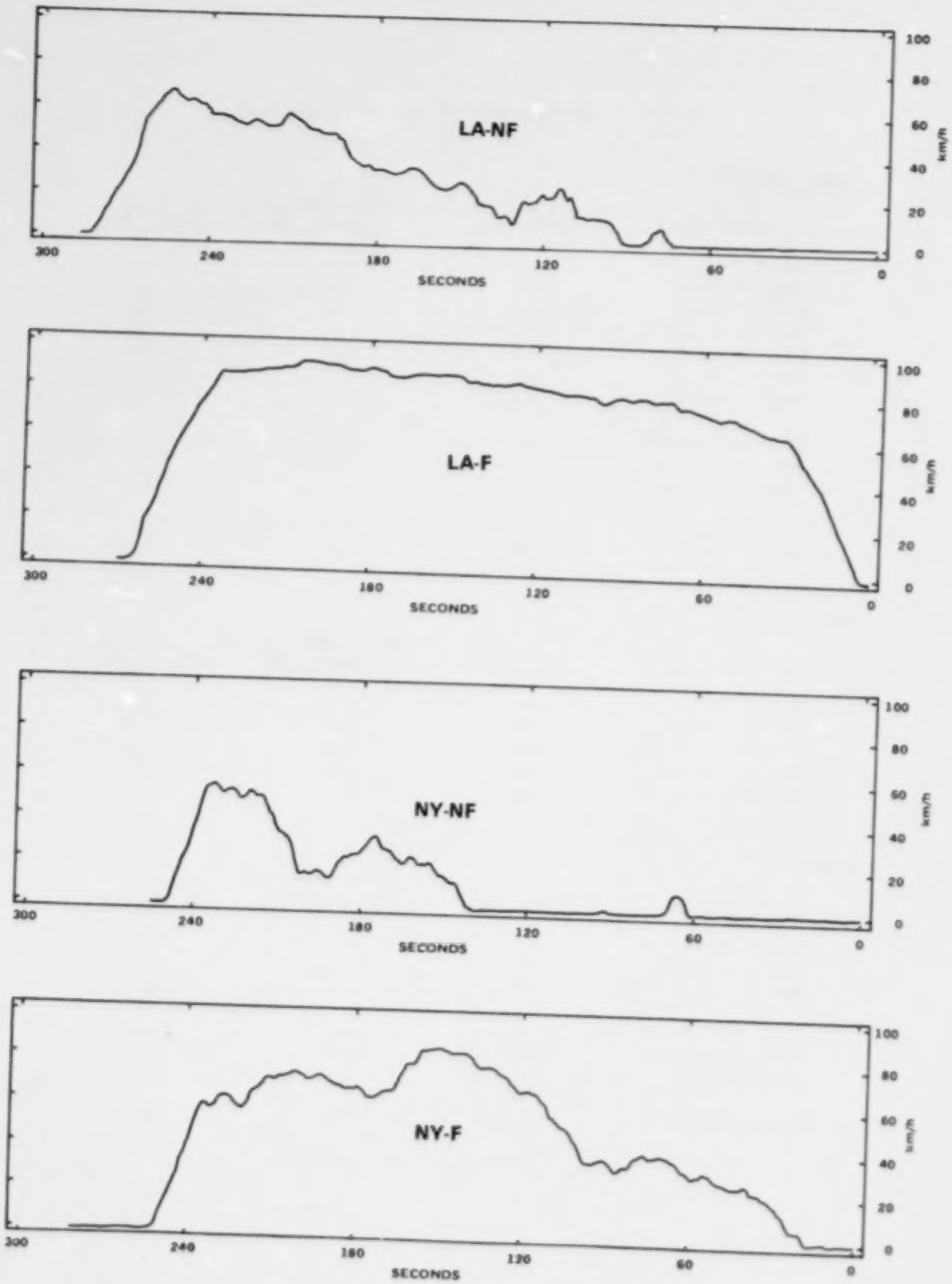


Figure 3. CAPE-21 transient driving cycles

III. OVERHAUL OF THE PHASE II ENGINE

The initial task in this project phase involved a systematic disassembly and inspection of the Phase II emission control configured engine. The inspection involved rating, measuring and photographing the basic engine and components. Primary emphasis in the engine inspection was to determine the causes(s) of high oil consumption which occurred during the latter stages of Phase II testing. At the time of disassembly, the engine had a total of over 2000 hours of operation. The Phase II operation on the engine included: 468 hours in the optimization evaluation phase, 1500 hours of service accumulation plus over 23 nine-mode emission tests, and several dozen hours during the driveability and performance demonstration.

Several views of the intake and combustion chamber areas of the engine are shown in Figures 4 through 6. These figures illustrate that there was no severe deposition within or on any of the areas shown. The number stamped on the head of the valve was readable on the original of the lower photograph in Figure 6.

Deposits within the intake, combustion and exhaust of the engine were visually rated and descriptive results of the ratings are given in Appendix B-1. There was no severe deposit buildup within or on any of these areas. (General concensus has tended toward describing these deposits as being rather mild. However, there is no accepted established data base on which to reach a definite conclusion).

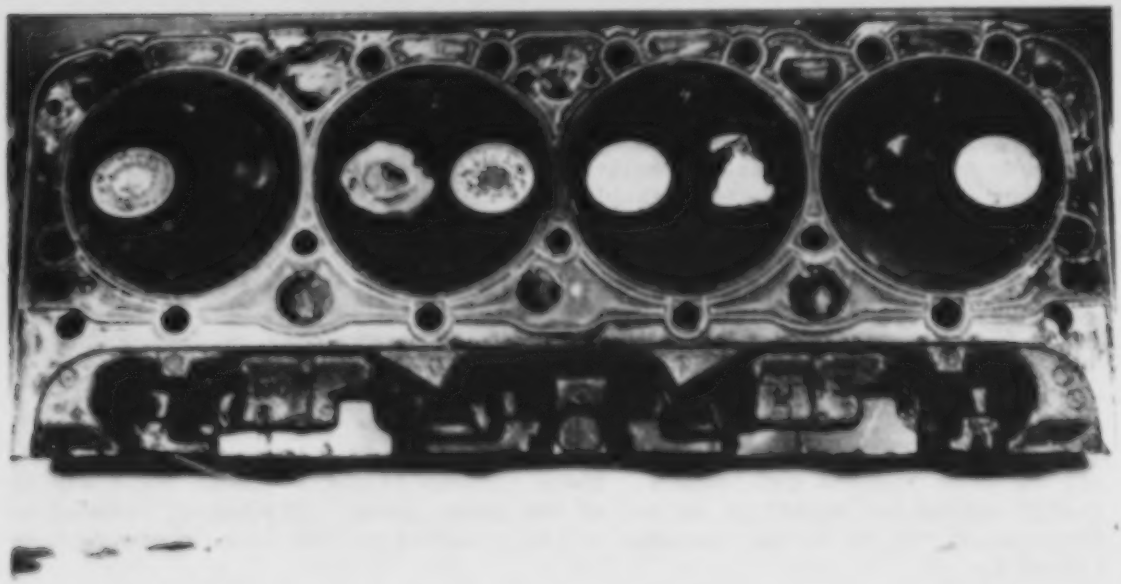
Of interest were the sludge-like deposits within the lower throat area of the throttle body. Two potential sources of these deposits were crankcase blowby and the recirculated exhaust. Any crankcase blowby in excess of that which can flow through the PCV valve, enters the air intake system between the air filter and the throttle body. The recirculated exhaust was introduced into the air intake system just below the throttle body.

A sludge and varnish rating of the engine was made, to the extent possible, using the SEQUENCE 5C data sheets and rating definitions.[8] It should be emphasized that this engine was not a SEQUENCE 5C engine and was not operated over the SEQUENCE 5C operating conditions. The results of the rating are summarized in Appendix B-2. In general, all areas were essentially clean from sludge. The varnish deposits on the piston skirts and valve lifters and deposits on the intake valves could be described as moderate.

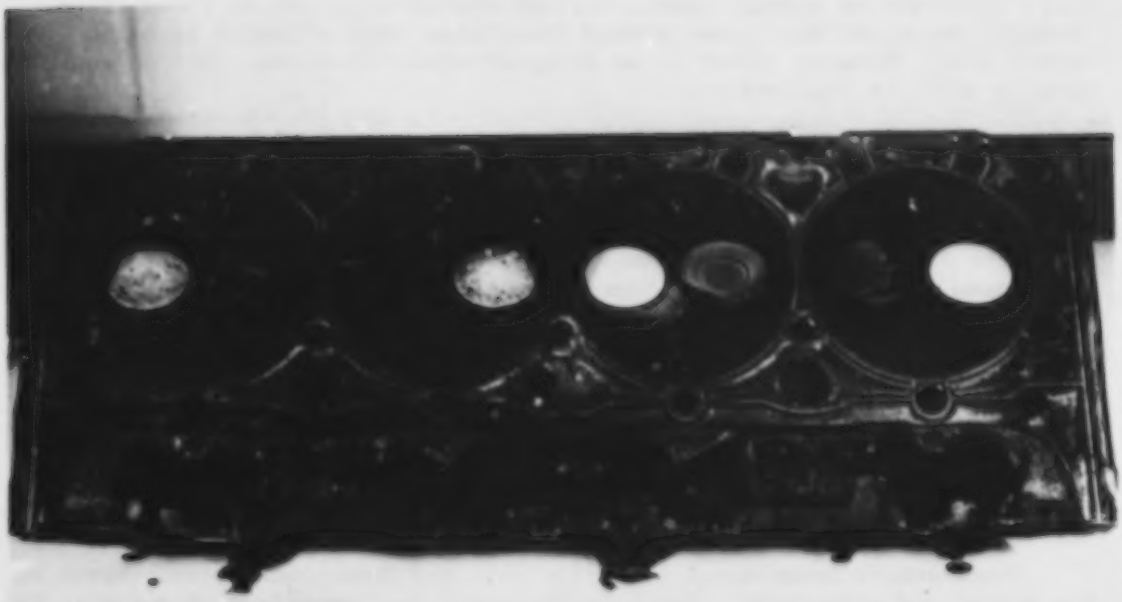
Other engine inspections primarily involved dimensional measurements of the engine and components. These measurements are summarized in Appendix B-3. Some items of interest are summarized as follows:

CYLINDER BORE

Cylinders 3 and 7 exceeded the allowed value of 0.127 mm

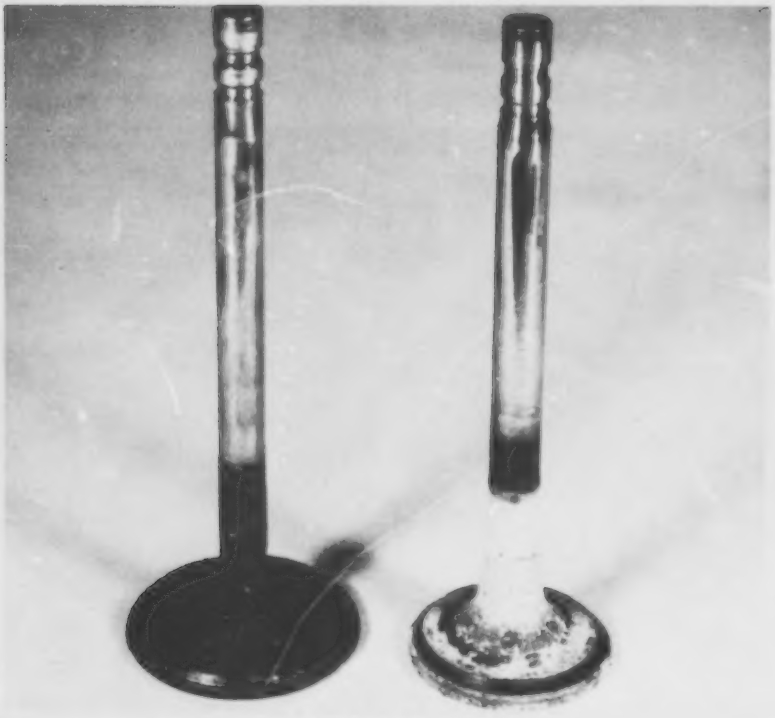


Right side

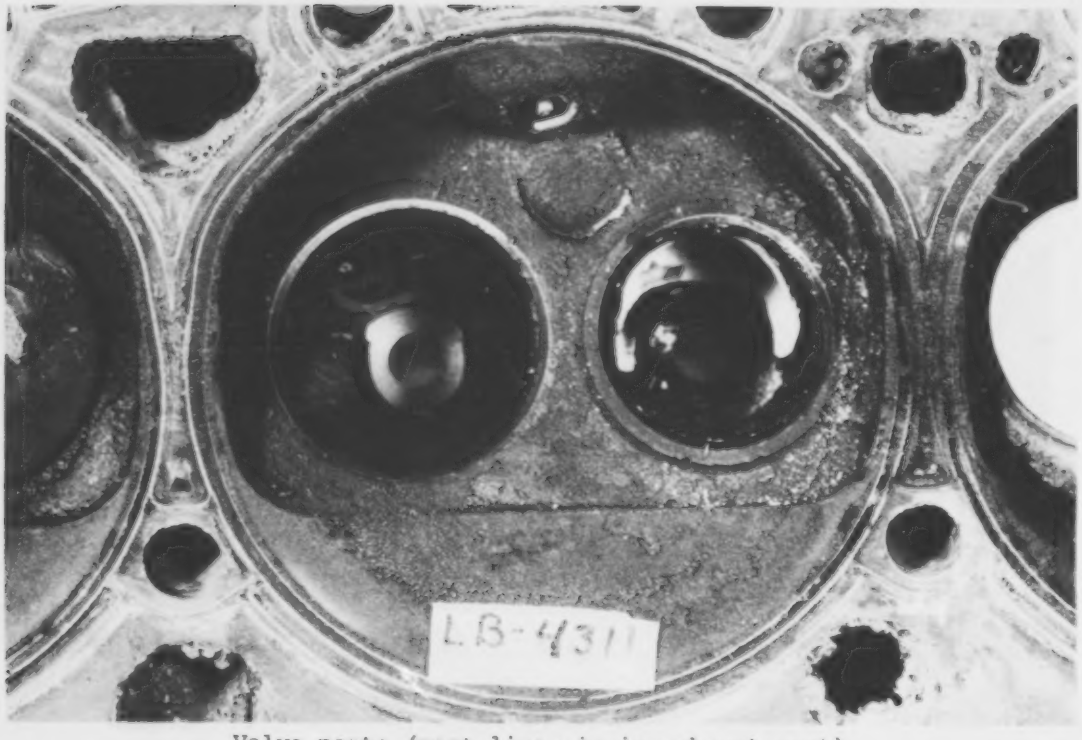


Left side

Figure 4. Cylinder heads from the Phase II engine

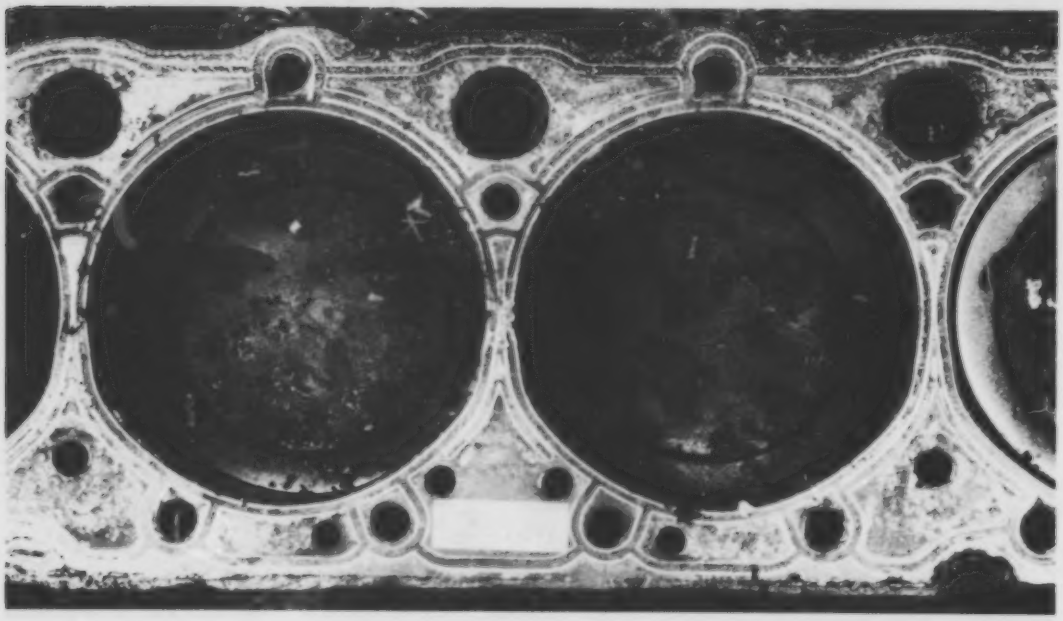


Valves

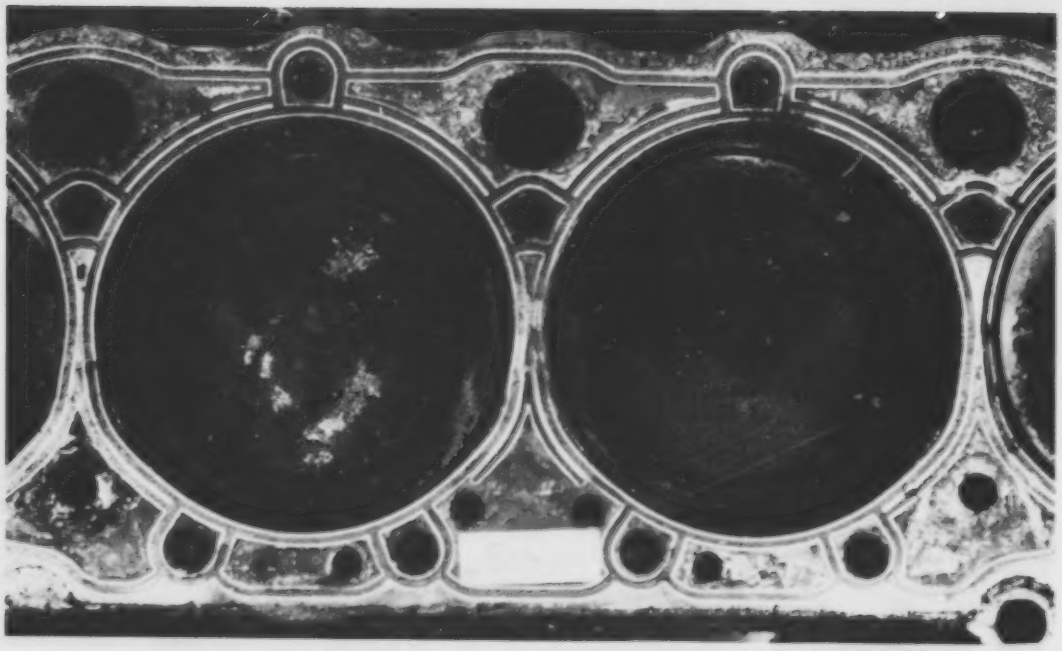


Valve ports (port liner is in exhaust port)

Figure 5. Cylinder Number 5 valves and valve ports



Cylinder Number 4



Cylinder Number 5

Figure 6. Deposition on valve heads

taper or wear and required reboring to the 0.51 mm minimum oversize. Cylinder 3 also had a longitudinal groove approximately 0.05 mm deep.

Cylinders 1, 2 and 8 were marginally within the allowed value, but had a longitudinal ridge the width of the ring end gaps.

PISTON RINGS

Rings on pistons 3 and 7 showed much greater wear than the rings on the other pistons. Compression rings on cylinders 1, 2 and 8 were axially lined up and left a longitudinal ridge on the cylinder walls.

CRANKSHAFT

Bearing journals for connecting rods 7 and 8 were worn and scored. This required regrinding the journals to 0.25 mm minimum undersize.

Unfortunately, it was not possible to determine specific causes for the areas of wear or damage. It should be noted that most of the problems were essentially isolated occurrences. Also, in at least one area out of the four listed, the problem does not appear to be even potentially relatable to the advanced technology aspects of the engine (e.g., the rod journals on the crankshaft). Another factor that could be pertinent is that ring-cylinder related problems were also experienced with the other engine used in Phase II. The problem experienced with the other engine was briefly discussed on page 30 of the Phase II Final Report.[1] The other engine had less than 200 operating hours and none of the operation involved the system used in the service accumulation demonstration of this engine.

Visual observation, by several individuals with engine overhaul experience, indicated that the engine condition generally appeared to be within the range of conditions they have observed in the past during engine overhauls. Most comments concerning potential abnormalities were the longitudinal groove in Cylinder 3, the longitudinal ridges in Cylinders 1, 2, and 8 and the condition of the crankshaft journals and bearings for connecting rods 7 and 8.

Therefore, it appears that the high oil consumption was due to the condition of the rings and cylinder walls in several of the engine cylinders. A major contributing factor was the axial line-up of the gaps in the compression rings on three of the pistons. This resulted in the formation of ridges on the cylinder walls; which in turn were detrimental to the functioning of the oil rings.

The engine was then rebuilt to "like-new" condition. This included reboring the cylinders to the standard oversize of 0.762 mm (0.030 inch), grinding the crankshaft journals to 0.254 mm (0.010 inch) undersize, instal-

ling exhaust valve guide inserts, and replacing components as applicable. The valve stem to valve guide clearances on the exhaust valves were marginal. The approach taken was that all marginal components were either reworked or replaced.

Delays were encountered in attempting to obtain all components through the local authorized Chevrolet dealer. Obtaining oversize pistons and rings through the dealer, in any reasonable period of time, could not be assured. Therefore, a replacement piston made by TRW was obtained and evaluated. After determining that these replacement pistons are basically identical in design to the original pistons, the decision was made to utilize TRW pistons and rings.

The rebuilding involved the following major components and operations which were necessary on the basis of maximum allowable limits:

- Rebore cylinders to standard oversize of 0.762 mm (0.030 inch)
- TRW replacement pistons and rings of 0.762 mm oversize
- Grinding crankshaft to 0.254 mm (0.010 inch) undersize
- Crankshaft main and connecting rod bearings of 0.254 mm undersize
- New exhaust valves and valve guide inserts
- Valve job, new valve springs, knurl intake guides

The following items were replaced on the basis of either new component tolerances or attempting to forestall potential problems during the emissions evaluation task of this project:

- Replace oil pump, water pump and freeze plugs
- Replace camshaft and camshaft bearings
- Replace valve lifters, push rods and rocker arms
- Replace timing gear and chain

Also, plastigage was used to assure bearing clearances, rubbing surfaces were coated with lubriplate, and all new gaskets were used. After the engine rebuilding was completed, the engine started without difficulty.

IV. INSPECTION OF THE EMISSIONS AND FUEL CONTROL COMPONENTS

The fuel and emissions control components (fuel injection, thermal reactors and EGR) were given a detailed visual examination. No visually discernible problems were detected with the fuel injection system. With the exception of some deposits on the wire mesh screen filter in the back-pressure EGR valve, the EGR valves had only minor deposits and appeared to be in good operating condition. The deposit ratings for the thermal reactors and the EGR valves are given in Appendix B-1. There were no areas of severe deposition within these components. A view of two of the fuel injectors is shown in Figure 7.

Significant deterioration of the exhaust thermal reactors was observed as follows:

LEFT BANK REACTOR

> Damaged inner can and a crack in the housing on the back side; broken manifold bolt in the same area as where the housing cracked.

RIGHT BANK REACTOR

> Visually appeared to be in satisfactory condition except for a small crack in the housing and an air injection tube which had broken off.

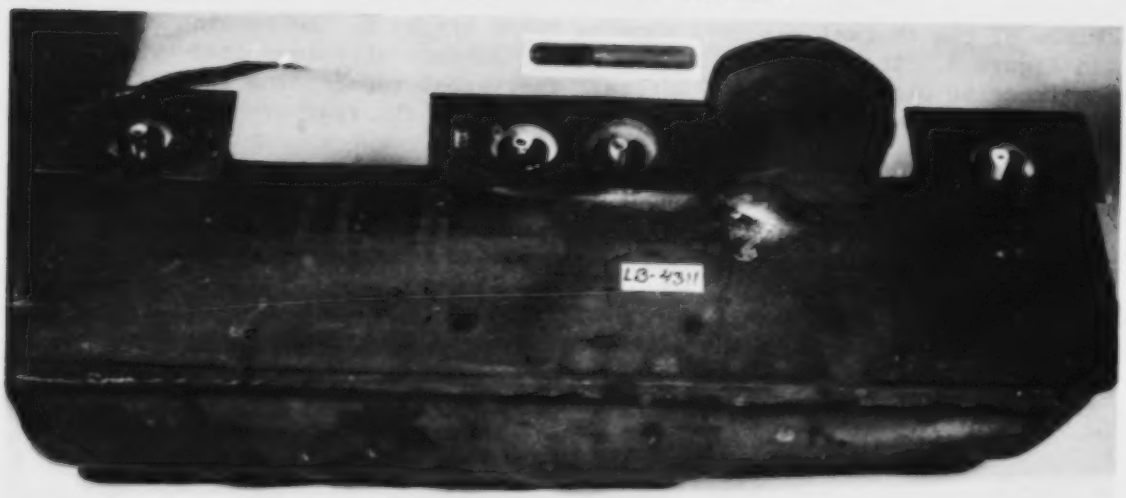
Views of the thermal reactors showing these cracks in the housing are given in Figure 7. These thermal reactors were subsequently inspected by the Engineering Staff at General Motors. The verbal report from the General Motors Technical Center was that overheating of the reactors had apparently occurred.

Times at which overheating could have occurred were during periods of misfire in the service accumulation demonstration and/or, probably even more likely, during maximum speed and power operation in the driveability and performance demonstration.

Taking into account the extent and type of operation on the engine, the condition of all other fuel and emissions control components were generally acceptable.

Fuel injectors - right manifold

Right exhaust thermal reactor



Left exhaust thermal reactor and broken bolt

Figure 7. Fuel injectors and exhaust thermal reactors

V. RESULTS OF THE PHASE III ENGINE TESTING PROGRAM

The laboratory evaluations involved operation of the engine on an engine dynamometer followed by operation on a chassis dynamometer with the engine installed in a suitable heavy-duty truck.

A. Engine Dynamometer Evaluations

With the ignition timing, idle speed and idle mixture adjusted to manufacturer's specifications, the engine was operated 25 hours using the same break-in cycle as was previously used in Phase II. Following the break-in operation, the maximum power output was determined at several speeds. The results, corrected to 746mm and 29.5 °C per the formula in the recommended procedure[3], were as follows:

Engine Speed, rpm	Current Phase III Results		Previous Phase II Results	
	kW	bhp	kW	bhp
1600	57	76	56	75
2000	73	98	71	95
2400	89	120	86	115
2800	101	135	98	132
3200	109	146	107	143
3800	116	155	116	156

As shown, the power output values were somewhat higher (approximately 1.5 to 4 percent) for the rebuilt engine at all engine speeds listed, except for 3800 rpm. At 3800 rpm, the power output of the rebuilt engine was essentially equal to the power output of the previous Phase II results (the results differed by less than one percent).

An item of potential interest is that the 0.762 mm (0.030 inch) oversize cylinders in the engine increase the cross-sectional area by 1.5 percent. With the same stroke, an increase in bore results in an equivalent increase in displacement.

1. Engine Dynamometer Nine-Mode Results

Following break-in operation and determination of maximum power, baseline configuration nine-mode evaluations were conducted with the overhauled engine in the standard configuration. The results of these baseline configuration emissions tests are reported in Appendix C and are summarized in Table 4. The previous Phase II baseline results are also included in the table. The procedure identified as 9-FTP is the certification procedure for 1975 heavy-duty gasoline engines[6] and 9-EPA is the recommended version of the certification procedure for 1979 model year heavy-duty engines.[3] As previously discussed in Section I, there are slight differences between the recommended version and the final certification procedure for 1979 model heavy-duty gasoline engines.

The nine-mode FTP emissions from the overhauled engine were well within the 1975 certification requirements. The hydrocarbon (HC) and carbon monoxide (CO) emissions and the specific fuel consumption (SFC) were lower and the oxides of nitrogen were higher with the overhauled engine than with the engine when new in Phase II.

In the Phase III nine-mode EPA evaluations with the engine in the baseline configuration, all emissions and the SFC agreed quite well with the Phase II baseline values. Run 3 of Test 2002 was conducted on a different day than were Runs 1 and 2 and differences in CO and NO_x emissions in Run 3 relative to Runs 1 and 2 were observed. The differences were primarily due to differences in the 90 percent power mode. This same situation occurred in the Phase II evaluations; where the differences in emissions between Test 211 and 212 were significant. The SFC results were a few percent lower with the Phase III overhauled engine than with the engine when new in Phase II.

Upon completion of the evaluations in the baseline configuration, the engine was converted to the Phase II emissions control system configuration. The nine-mode evaluations conducted are reported in Appendix C and are summarized in Table 4. For comparison purposes, Table 4 also includes some of the average results obtained in the previous Phase II evaluations.

No significant difficulties were encountered with the fuel or emissions control systems. Minor adjustment was required to the cold-engine, high-speed idle system to enable attaining normal idle speed within the five minute warm-up. Also, some adjustment of the EGR rate at the 90 percent of maximum power mode was required. The engine operational characteristics appear to be essentially equivalent to that experienced during the Phase II evaluations. Areas discussed in the Phase II final report, such as the relatively significant HC emissions during cut-throttle operation, also apply to these current evaluations.

As shown in Table 4, the current Test 2007 nine-mode EPA test results compare quite well with the Phase II average results of Tests 261, 262, 263, and 265. The current hydrocarbon emissions are about 50 percent higher than the Phase II average. On an absolute basis, however, the difference in hydrocarbon emission levels is only 0.17 g/kWh.

The evaluations with catalyst were conducted using a new Engelhard Exhaust Gas Purifier PTX 7.25-2-3MOD3. This catalytic converter was obtained at the same time and is identical in construction to the unit used during Phase II. Due to the late arrival of the catalysts during Phase II, the engine had over 1000 hours of operation before the catalyst was installed; as compared with less than 50 hours in Phase III. Therefore, no data are available to enable making direct comparisions between the Phase II and Phase III results. The current results with the catalyst appear to be significantly different from the results obtained during the Phase II service accumulation evaluation. Although direct comparisons of these results are not appropriate, differences in some of the emissions values reported in Table 4 are relatively large and merit some discussion.

TABLE 4. ENGINE DYNAMOMETER NINE-MODE EMISSIONS TEST RESULTS

Test No.	Type Test	Description	Gram/kW hr				kG/kW hr
			HC	CO	NO_x	$HC+NO_x$	SFC
----	9-FTP	Standard for 1975 Model Year HD Engines	-----	53.64	-----	21.46	-----
2001	9-FTP	Phase III Baseline After Overhaul	5.31	19.40	12.61	17.92	0.469
210	9-FTP	Phase II Baseline Carb 6606	6.57	29.45	12.05	18.62	0.530
2004	9-FTP	Emissions Control System	0.98	19.83	3.82	4.80	0.510
2005	9-FTP	Emissions Control System with Cat.	0.12	0.44	3.94	4.06	0.554
2002	9-EPA	Phase III Baseline After Overhaul	5.44	30.70	13.10	18.54	0.430
211 & 212	9-EPA	Phase II Baseline Carb. 6606	5.73	33.65	12.11	17.84	0.450
2007	9-EPA	Emissions Control System	0.52	13.30	4.65	5.00	0.393
261-265	9-EPA	ECS Phase II Average	0.35	12.07	4.46	4.81	0.392
S.A.	9-EPA	ECS Ser. Accum. Avg. 000-1500 hours	0.42	15.00	3.42	3.84	0.394
2006	9-EPA	Emissions Control System with Cat.	0.02	0.11	4.03	4.05	0.408
S.A.	9-EPA	ECS Ser. Accum. with Cat. Avg. 0-750 hours	0.08	16.38	2.19	2.27	0.404

On an absolute basis, the difference between the 0.02 and 0.08 g/kWh HC values is not very significant. The one percent difference in specific fuel consumption is also not very significant. The differences in the CO and NO_x values with the catalyst installed, however, are significant.

In the Phase II evaluations, it should be recalled that essentially all of the test composite CO emissions occurred during the 90 percent of maximum power mode and that the variation between tests was quite large. This was indicative of a somewhat marginal situation relative to the availability of sufficient air to complete the oxidation reactions in this mode. The causes for the low NO_x values in the Phase II Service Accumulation evaluations were not determined. One of several possible causes mentioned in the Phase II final report was the catalyst acting as a reduction catalyst. Determinations of specific causes for the variation in CO and NO_x with the oxidation catalyst installed was not within the scope of work in either of Phases II or III. The current results, as obtained in Test 2006, are more in line with what would normally be expected relative to the results obtained without a catalyst.

Summary results of those nine-mode evaluations conducted during Phase III are presented on bar charts in Figure 8. These charts clearly illustrate the very substantial reductions in HC and NO_x emissions that were obtained with the emissions control configurations in the nine-mode evaluations.

B. Chassis Dynamometer Evaluations

Initially, a Chevrolet C-60 truck with a 1975 model 350-V8 engine was obtained and operability of the truck over the CAPE-21 driving cycles was demonstrated. Several views depicting the chassis dynamometer evaluations are shown in Figure 9.

The truck, obtained for use in this project, is described as follows:

	Truck	Engine	Transmission
Make	Chevrolet	Chevrolet	New Process Gear
Model	C-60	113-350	542
Iden. or Ser. No.	CCE626V108145	V0930TMX	---
Model Year	1976	1975	---
Style or Type	Van (4.9 metre)	V-8	5 Speed

Source	Budget 16002
Usage	Rental
Odometer, km	34298
GVW, kg	9072
Empty Wt., kg	4468
Axle Ratio	Single Speed
Tire Size	9.00-20

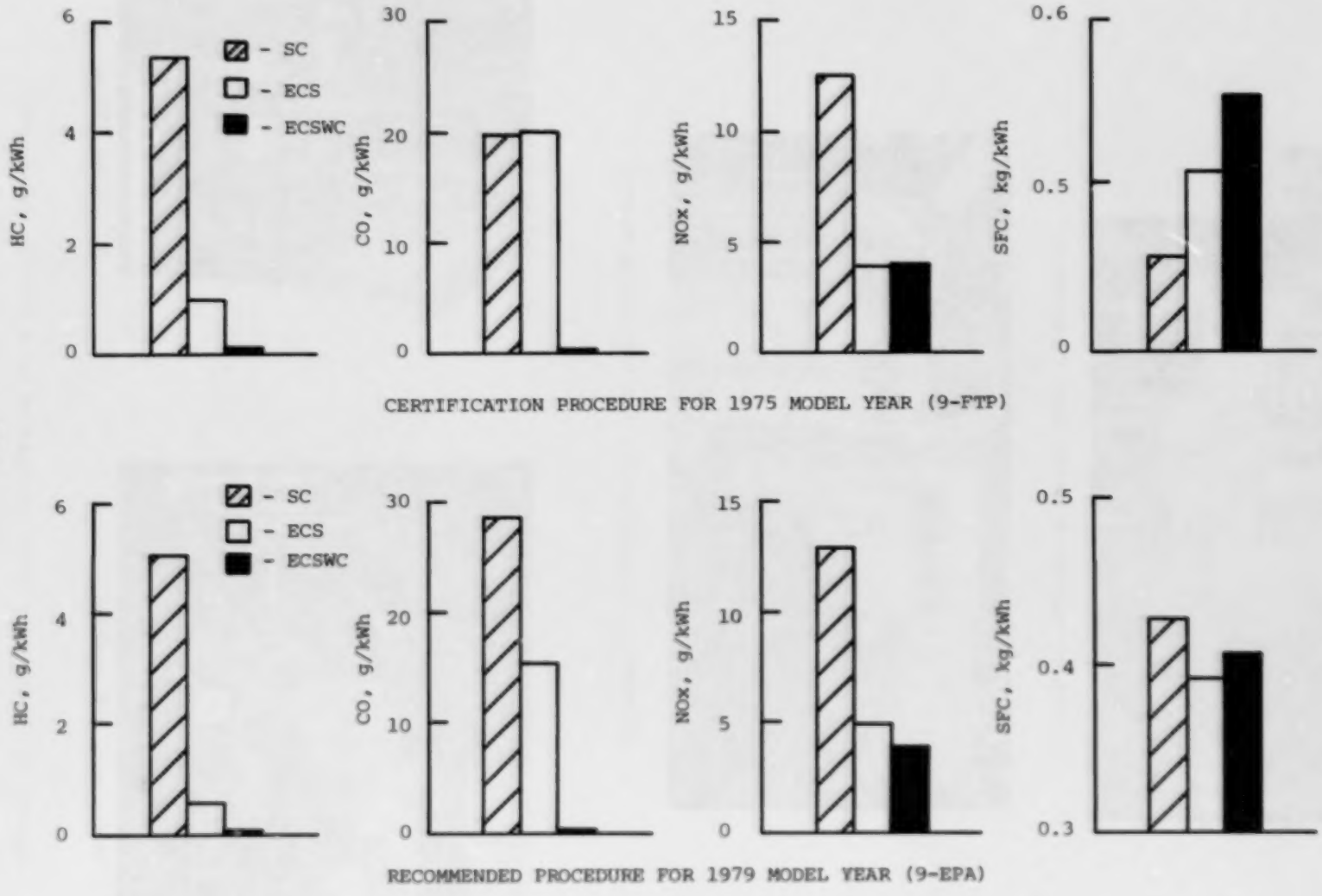
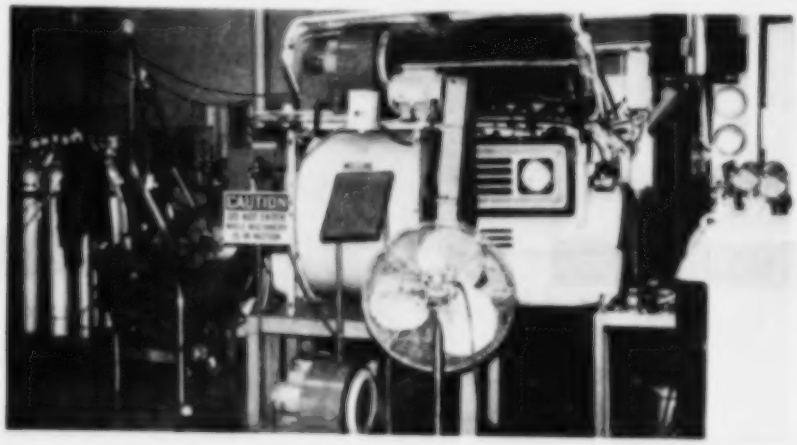
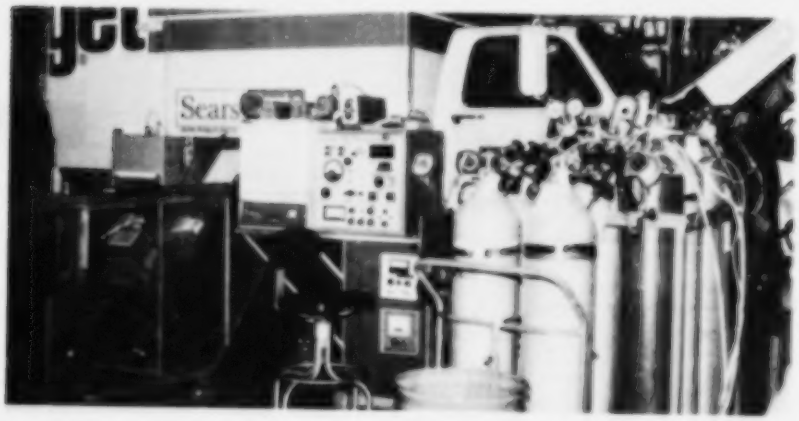


Figure 8. Emissions and fuel consumption using nine-mode heavy-duty gasoline engine procedures

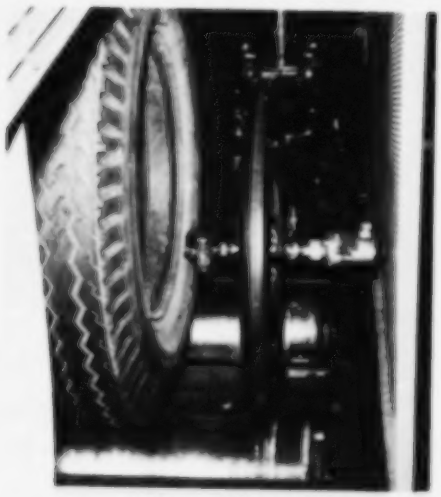


Truck installed on heavy-duty dynamometer



Emissions instrumentation for continuous traces

Heavy duty CVS system



Labeco 5th wheel

Figure 9. Heavy-duty truck evaluation on a chassis dynamometer

This truck (No. 16002) is the same model and was purchased by the rental agency at the same time as the truck (No. 16001) used in the Phase II driveability demonstration. This truck, however, appeared to be somewhat more typical of used trucks evaluated in previous projects than was truck No. 16001. For example, a couple of backfires were experienced during the drive to this laboratory and after-run was experienced upon shutting off the ignition whenever the engine was fully warmed-up. Overall, based on previous project experience with used trucks, this truck was considered as being in acceptable operating condition. The body and drive train were considered as being in good condition.

This truck had five forward gears. First gear, however, is not normally required or used in over-the-road operation (except possibly when fully loaded or when operated in hilly terrain). Therefore, all starts were made in second gear. The shift-point vehicle speeds shown on the Light-Duty FTP cycle were found to be generally suitable for this truck. With this truck, however, the transmission was always in one gear higher than shown on the cycle (i.e., in fourth instead of third, in fifth instead of fourth, etc.). The engine speed at each of the shift points was approximately 3600 rpm, which approaches the governed speed of 3800 rpm. Similar shift points were used for the CAPE-21 cycles, with some slight modifications to more properly coordinate the shift points to the specific cycle operation.

No significant problems were observed in driving the truck at half load, over the CAPE-21 cycles provided for this project. The inertia simulation was 7700 kg (17,000 lbs) and the power setting was 17.9 kilowatts (24 hp) at 64 kilometres per hour (40 mph). A few of the very steep accelerations on the charts could not quite be attained. The accelerations which could not be met are identified as follows (the CAPE-21 cycles were shown in previous Figure 3).

Cycle	Acceleration km/hr	Acceleration Location in Cycle (sec)
LA-NF	40 to 50	190 to 195
NY-NF	20 to 30	200 to 205
	45 to 55	210 to 215
NY-F	60 to 70	110 to 115
	80 to 90	135 to 140

These deviations of the actual drivers trace from the prescribed trace were slight and had essentially no effect on total distance or overall truck operation over the cycles. The cycles could be considered as being somewhat lively for this truck at half load and required considerable driver effort to remain on the trace (i.e., rapid acceleration, clutch and gear shift operations). In summary, the CAPE-21 cycles provided were driveable

and appear to represent realistic operation for at least one segment of the truck driving population.

As determined in previous projects, the 505 segment of the light-duty FTP cycle has a number of accelerations which are too demanding for a truck of this type. For example, between 190 and 210 seconds from start of the cycle, an acceleration from 30 to 75 km/hr is shown to require about 15 seconds on the chart. With this truck, at half load, about twice that much time was required. For purposes of this project, whenever the acceleration could not be attained, wide-open-throttle operation was maintained until the actual truck speed reached the printed speed trace.

The evaluations, with the engine installed in the truck, included duplicate determinations with the:

- Chassis version of the nine-mode FTP
- CAPE-21C and CAPE-21H cycles
- Light-duty FTP

These evaluations were conducted with the engine in the baseline configuration and in the Phase II emission control configuration, with and without an oxidation catalyst.

1. Chassis Version Nine-Mode FTP Results

The chassis version nine-mode FTP results are reported in Appendix D and are summarized in Table 5. The tests with the engine in the emission control system (ECS) configuration, with and without the catalyst, were the first tests run on the chassis dynamometer and the tests in the baseline configuration were the last tests conducted. Itshould be noted that the horsepowers shown on the computer printouts were not measured in these chassis evaluations. The average horsepowers obtained in the engine dynamometer operation were utilized. This was done to enable reporting the results in units consistent with those previously reported. As shown in Table 5, the composite modal results on the chassis dynamometer agree reasonably well with the results obtained on the engine dynamometer. This reasonable agreement tends to validate the removal and subsequent installation of the engine into the truck without having seriously modified its emissions behavior.

Nine-mode FTP emissions on the chassis dynamometer were evaluated using the standard modal procedure and using bagged CVS diluted samples of the total twenty minutes of the nine-mode FTP. The results of both methods, in units of grams per minute, are presented in Table 6. Based on these data and a review of the continuous emission charts, the following appear to be applicable.

The major difference between the bagged HC results and the modal composite HC results, for the system without catalyst, appeared to be due to the

TABLE 5. ENGINE AND CHASSIS DYNAMOMETER

NOTE: This table reports results of evaluations conducted on both engine and chassis dynamometers.

Engine Configuration	Dynamometer	Emissions, g/kW hr				Fuel
		HC	CO	NO_x	HC + NO_x	kg/kW hr
BL[a]	Engine	5.31	19.40	12.61	17.92	0.469
BL	Chassis[b]	6.07	25.82	13.57	19.64	0.494
BL	Phase II[c]	6.57	29.45	12.05	18.62	0.530
ECS[d]	Engine	0.98	19.83	3.82	4.80	0.510
ECS	Chassis	0.92	18.27	3.30	4.21	0.511
ECSWC[e]	Engine	0.12	0.44	3.94	4.06	0.554
ECSWC	Chassis	0.07	0.30	3.05	3.12	0.561

---

[a] Essentially standard engine configuration as used to establish project baseline values

[b] A chassis version of the nine-mode FTP; power was not measured in the chassis version evaluations; average power values from the respective stationary dynamometer evaluations were used to enable reporting the chassis version results in consistent, familiar units

[c] Average results obtained with the standard configuration on an engine dynamometer in Phase II of the project

[d] Emissions Control System

[e] Emissions Control System plus an oxidation catalyst

TABLE 6. CHASSIS VERSION NINE-MODE FTP RESULTS

Engine Configuration	Sampling Method	grams/minute			
		HC	CO	NO_x	Fuel
BL	Modal	1.64	7.0	3.66	134
	Bagged	1.66	7.8	3.18	132
ECS	Modal	0.19	3.8	0.69	106
	Bagged	0.64	4.9	0.72	101
ECS w/Cat.	Modal	0.01	0.1	0.57	104
	Bagged	0.12	0.8	0.67	102

HC during cut-throttle (CT) operation. These HC emissions during CT do not enter into the modal calculations due to there being no fuel flow. The remaining difference appeared to be due to spikes which occurred during some of the mode changes.

For the system with an oxidation catalyst, the entire difference appeared to be due to spikes. The HC at cut-throttle consisted of a relatively severe spike followed by a value of only a few ppm. An accurate average value during CT could not be readily determined and was considered as not being essential since the CT value does not enter into the calculations for these tests. With and without the oxidation catalyst, the differences in CO values, for the bagged relative to the modal results, appeared to be primarily due to spikes.

The differences in NO_x, with the ECS configurations, appeared to be largely a function of mode 7 (the 3 inches of vacuum mode) where the NO_x value started out higher than the final value and decreased with time. The NO_x decrease in mode 7 without the catalyst was slight, whereas, with the oxidation catalyst the decrease was significant. This also occurred during the previous Phase II durability demonstration and was discussed in that section of the Phase II final report. With the baseline configuration, the NO_x increased with time in Modes 3 and 7.

As previously mentioned, from the continuous raw emission traces, it was noted that spikes frequently occurred during the mode changes; primarily when going to the cut-throttle mode. With the ECS engine, plus the oxidation catalyst, approximately 0.11 out of the 0.12 grams per minute HC measured in the bagged sample appeared to be attributable to such spikes. Of the 0.64 grams per minute HC obtained in the bagged sample with the ECS engine, it appears that approximately one third can be attributed to each of the following: (1) the stabilized portions of modes 1 through 8, (2) the stabilized cut-throttle emissions, and (3) the spikes which occurred at mode changes. Of the 1.7 grams per minute HC obtained in the bagged sample, with the baseline configuration, essentially all was accounted for in the standard nine-mode results; which includes the initial spike at cut-throttle. Including the initial spike at cut-throttle, however, it appears that at least 0.1 out of the 1.7 grams per minute HC is accounted for by spikes.

The primary significance of the preceding appears to be the obvious conclusion that spikes become increasingly more significant, on a relative basis, as the composite emission level decreases. A point is reached at which the spikes become a major contributor to the total HC emissions actually emitted and should probably become an important optimization criteria.

2. Transient Cycle Results

The transient cycle results are reported in Appendices E through G and are summarized in Table 7. Bar charts of the summarized results are presented in Figures 10 through 12. Since no modal weighting factors were available for the CAPE-21 cycles, no total or composite values could be

TABLE 7. SUMMARY OF THE TRANSIENT CYCLE RESULTS IN G/KM

		Standard Configuration				Emission Control System				Emis. Cont. Sys. w/Catalyst			
		Emissions, g/km			Fuel	Emissions, g/km			Fuel	Emissions, g/km			Fuel
Test	Cycle	HC	CO	NO_x	ℓ/100km	HC	CO	NO_x	ℓ/100km	HC	CO	NO_x	ℓ/100km
CAPE-21C	LA-NF	25.20	216.2	4.70	58.5	17.35	104.8	3.06	53.5	15.90	97.8	2.07	55.4
	LA-F	3.17	107.2	7.38	44.6	0.48	16.3	5.47	43.6	0.23	28.2	3.50	45.3
	LA-NF	7.64	80.6	5.25	40.7	3.82	15.3	2.71	38.2	0.31	7.2	2.11	40.0
	LA-F	2.87	106.2	7.11	44.4	0.56	22.3	4.42	42.4	0.25	33.6	3.02	43.4
	NY-NF	13.44	124.3	5.94	57.2	9.41	22.0	4.79	50.1	1.43	8.6	4.40	53.7
	NY-F	5.35	121.3	5.26	41.1	1.33	10.1	4.25	36.1	0.18	9.2	3.28	39.0
	LA-NF	11.10	77.2	5.91	42.6	7.16	21.8	3.24	40.3	0.92	5.1	2.35	40.7
	LA-F	2.79	95.0	8.19	44.7	0.65	17.8	4.65	41.1	0.22	29.6	3.35	43.5
CAPE-21H	LA-NF	12.61	81.6	5.30	43.9	8.26	24.1	3.08	40.7	1.77	6.0	2.61	40.7
	LA-F	2.85	98.7	6.86	43.5	0.69	23.7	4.96	43.5	0.20	22.3	3.37	43.7
	NY-NF	15.58	128.9	5.39	56.7	11.56	32.2	4.30	52.1	1.57	6.8	4.58	53.0
	NY-F	5.75	116.0	4.78	39.1	1.53	14.3	4.13	38.4	0.20	9.2	3.34	37.7
LD-FTP	505C	12.68	198.3	5.59	54.9	6.00	50.3	5.82	52.2	3.56	41.2	4.53	50.1
	867S	7.80	76.8	6.40	46.4	5.56	17.5	4.65	46.3	1.70	8.5	3.69	45.8
	505H	8.13	156.0	6.22	47.4	4.39	22.2	6.66	46.2	1.48	16.1	5.13	46.0
	TOTAL	8.88	123.1	6.19	48.40	5.33	25.5	5.43	47.5	2.02	17.2	4.25	46.7

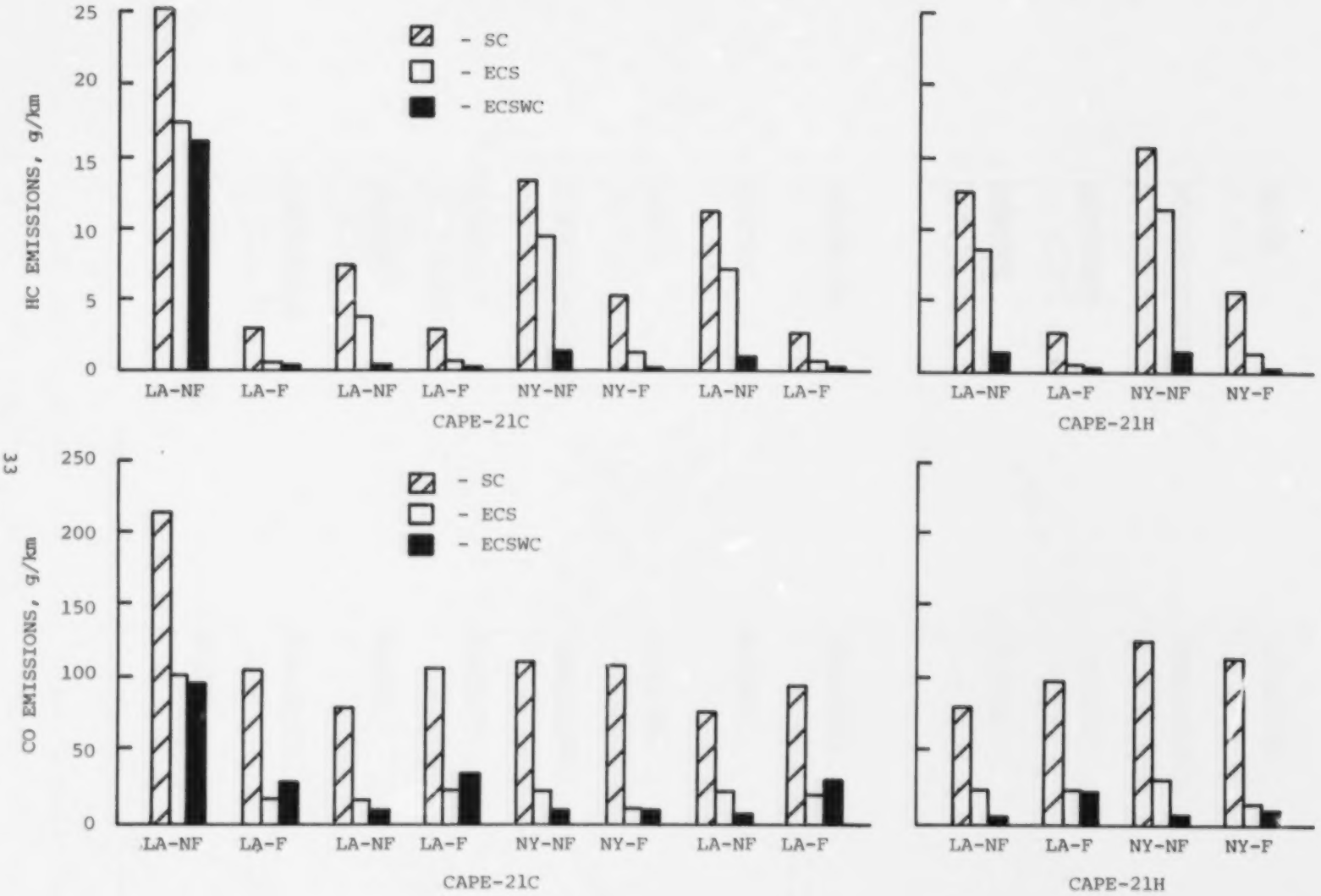


Figure 10. CAPE-21 transient driving cycle HC and CO emissions

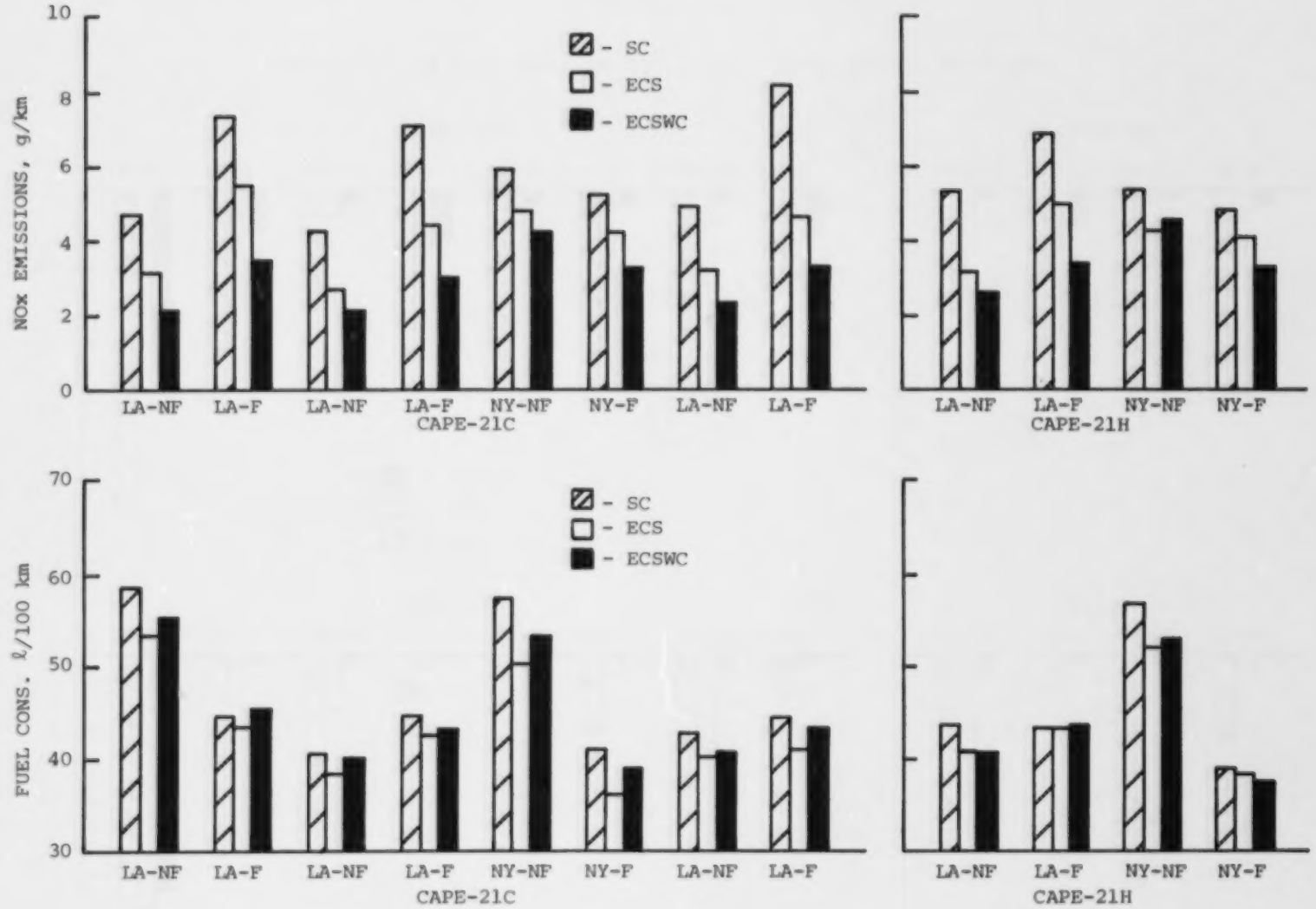


Figure 11. CAPE-21 transient driving cycle NO_x emissions and fuel consumption

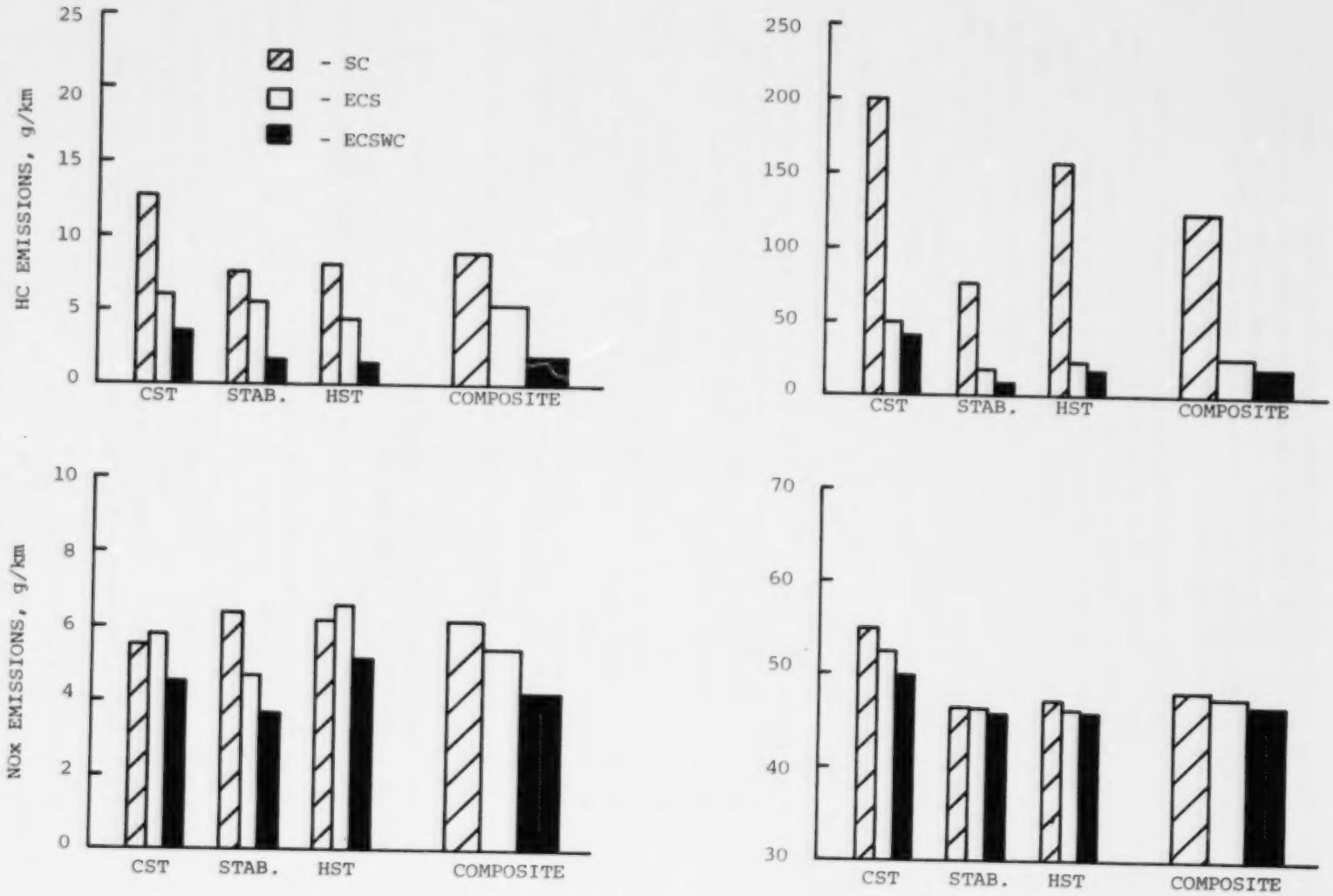


Figure 12. Emissions and fuel consumption using the federal test procedure for light-duty vehicles (LD-FTP)

calculated for the cold-start and hot-start CAPE-21 evaluations. Projects to establish national baseline emission levels, using cycles developed from CAPE-21, are currently in process. To avoid any potential confusion, the term standard configuration (SC), rather than baseline configuration will be used in the reporting of all transient cycle results.

In general, emissions and fuel consumption were lower with the ECS and ECSWC engine configurations than with the standard engine configuration. The differences in emissions between the two engine configurations, however, varied considerably depending on the specific cycle being compared. Such variations are apparent in the data summarized in Table 8. Refering to the data in Table 8, the precentage reduction in HC in the NY-F cycle with the ECS engine relative to the SC engine, was about three times the HC reduction in the NY-F cycle, (i.e., 74 divided by 26). The reduction in fuel consumption with the ECS engine was eight percent in the NY-F and only two percent in NY-NF. (It should be pointed out that the repeatability and reproducibility of emissions and fuel consumption have not been established for the CAPE-21 evaluations).

The LA-NF and the NY-NF cycles are relatively low speed with considerable operation at idle. The LA-F and NY-F cycles are higher speed with very little operation at idle. In general, HC emissions in g/km were significantly higher in the -NF than in the -F cycles. Both HC and CO emissions were significantly higher in the CAPE-21C cold start LA-NF cycle than in any of the other CAPE-21 cycles. There were no such broadly applicable trends apparent with the NO_x emissions, fuel consumption, or the CO emissions in other than the cold start cycles.

The CAPE-21C cold start LA-NF (Bag 1) had high HC and CO emissions relative to emissions over the same LA-NF cycle after the engine was warmed-up. With the engine in the standard configuration HC and CO emissions in Bag 1 were generally two to three times the emissions over the LA-NF cycle with the engine warmed-up. With the catalyst, HC and CO emissions in Bag 1 were generally 10 to 20 times the emissions over the LA-NF cycle with the engine warmed-up.

Following are several observations based on review of the raw emission continuous traces:

(1.) With the oxidation catalyst installed, it was approximately two minutes before effective catalytic control of the HC emissions was attained. It is important to note that Cycle 1 in the CAPE-21C is a cold start and initially has over one minute of idle operation before actual driving begins.

(2.) After the engine was warmed-up, the major source of the HC emissions appeared to be related to the cut-throttle operation. With the emission control system, with and without the catalyst, the major contributor of HC emissions appeared to be the spikes that occurred immediately upon going to cut-throttle. These spikes were significantly more severe without the catalyst than they were with the catalyst installed. Therefore, with the emission control system, the rate of HC emissions was greatest in those cycles having the greatest number of rapid engine decelerations; such as during rapid gear shifting.

TABLE 8. COMPARISON OF CAPE-21H NY-NF AND NY-F CYCLE RESULTS

Engine Configuration	Cycle	Emissions, g/km HC	CO	NO_x	Fuel, ℓ/100 km
SC	NY-NF	15.6	129	5.4	56.7
ECS	"	11.6	32	4.3	52.0
ECS w/Cat.	"	1.6	7	4.6	53.0
SC	NY-F	5.7	116	4.8	39.1
ECS	"	1.5	14	4.1	38.4
ECS w/Cat.	"	0.2	9	3.3	37.7
		In Percent of Standard Configuration			
SC	NY-NF	100	100	100	100
ECS	"	74	25	80	92
ECS w/Cat.	"	10	5	85	93
SC	NY-F	100	100	100	100
ECS	"	26	12	85	98
ECS w/Cat.	"	4	8	69	96
		In Percent Reduction from Standard Configuration			
SC	NY-NF	0	0	0	0
ECS	"	26	75	20	8
ECS w/Cat.	"	90	95	25	7
SC	NY-F	0	0	0	0
ECS	"	74	88	15	2
ECS w/Cat.	"	96	92	31	4

(3.) The sources of the CO emissions appeared to be wide-open-throttle operation and the spikes which occurred immediately after rapidly going to cut-throttle. The primary source appeared to be the wide-open-throttle operation at higher engine speeds.

With the emission control systems, the major contributor of NO_x emissions appeared to be operation at or near wide-open-throttle. With the standard configuration, the CO emissions were high (i.e., raw CO emissions greater than six percent) and the NO_x emissions were relatively low (less than 600 ppm) at WOT. The importance of this factor can be seen in comparing the CO and NO_x emissions results obtained with the standard configuration and the emission control system configurations. The CO emissions with the standard configuration were generally over four times greater than the CO emissions with the emission control systems. Standard configuration NO_x emissions, however, were generally not greater than two times the NO_x emissions obtained with the emission control system.

3. Additional Analyses of the Phase II Results

In Table 9, the summarized results are listed in units of grams per minute. A primary usage of data presentation in these units is that it enables some relative comparisons between the nine-mode and transient cycle results. The data in Table 9 show that HC and CO emissions were consistently significantly lower in the nine-mode tests than in the transient cycles. There were no such definite relationships apparent with the NO_x emissions.

In Table 10, the data for the emission control system, without and with the oxidation catalyst, are reported in terms of the percent of the value for the standard configuration. The percent values were calculated separately and individually for each cycle and/or composite value.

Referring to Table 10, the general trends of the transient evaluations relative to the nine-mode FTP and EPA evaluations are summarized as follows:

	Transient Emissions Relative to Nine-Mode Emissions		
	HC	CO	NO_x
Standard Configuration	Same*	Same*	Same*
Emission Control System	Higher	Lower	Higher
Emis. Cont. Sys. w/Cat.	Higher	Higher	Higher

* Assigned relationship for purposes of this illustration

Except for the CO emissions with the emission control system, these data indicate that the emissions reduction achieved in the nine-mode cycles were generally not achieved to the same degree in the transient cycles.

TABLE 9. SUMMARY OF THE PHASE III RESULTS IN G/MIN

Test	Cycle	Standard Configuration Emissions, g/min HC	CO	NO_x	Fuel g/min	Emission Control System Emissions, g/min HC	CO	NO_x	Fuel g/min	Emis. Cont. Sys. w/Catalyst Emissions, g/min HC	CO	NO_x	Fuel g/min
CAPE-21C	LA-NF	9.71	83.3	1.81	166.4	6.64	40.2	1.17	151.1	6.17	37.9	0.80	158.8
	LA-F	3.81	129.0	8.87	396.0	0.59	20.0	6.75	398.0	0.28	33.9	4.20	401.6
	LA-NF	2.97	31.3	2.04	116.8	1.48	6.0	1.06	109.5	0.12	2.9	0.83	116.8
	LA-F	3.41	126.1	8.45	390.3	0.67	26.9	5.32	373.1	0.30	40.5	3.63	386.1
	NY-NF	2.79	25.8	1.23	87.5	1.90	4.5	0.96	74.6	0.30	1.8	0.91	81.6
	NY-F	3.89	88.3	3.83	220.9	0.97	7.4	3.10	194.4	0.13	6.7	2.38	209.7
	LA-NF	4.35	30.2	2.32	123.3	2.74	8.4	1.25	114.2	0.35	2.0	0.92	117.6
	LA-F	3.40	115.5	9.96	401.2	0.79	21.5	5.61	366.4	0.27	35.8	4.04	388.3
CAPE-21H	LA-NF	4.99	32.3	2.10	128.5	3.18	9.3	1.19	116.1	0.70	2.4	1.02	118.2
	LA-F	3.46	119.7	8.32	389.5	0.82	28.2	5.91	382.5	0.24	26.8	4.04	388.2
	NY-NF	3.17	26.2	1.10	85.3	2.38	6.7	0.89	79.2	0.32	1.4	0.93	79.7
	NY-F	4.14	83.6	3.44	208.1	1.11	10.3	2.98	204.7	0.15	6.7	2.43	202.6
LD-FTP	505C	7.80	124.6	3.71	264.5	4.00	33.3	3.88	256.9	2.38	27.5	3.02	246.2
	867S	3.29	29.8	2.95	150.2	2.42	7.6	2.02	148.9	0.74	3.70	1.61	147.2
	505H	5.23	99.5	4.36	237.5	2.95	15.0	4.47	229.4	0.99	10.78	3.44	227.9
	TOTAL	4.42	59.6	3.37	187.3	2.78	13.3	2.83	182.9	1.05	8.97	2.22	179.6
9-FTP	Modal*	1.44	5.27	3.43	127.4	0.20	4.12	0.79	106.0	0.02	0.08	0.73	102.0
9-EPA	Modal*	1.73	9.78	4.17	136.9	0.16	4.20	1.47	124.0	0.01	0.03	1.27	128.4

* Engine dynamometer results (Reported in Appendix C)

TABLE 10. ECS RESULTS IN PERCENT OF STANDARD CONFIGURATION VALUES

Test	Cycle	Cycle	Percent of Values Obtained with the Standard Engine Configurations: Emission Control System HC	CO	NO_x	Fuel	Emis. Cont. Sys. with Catalyst HC	CO	NO_x	Fuel
CAPE-21C	LA-NF	1	69	48	65	91	63	45	44	95
	LA-F	2	15	15	88	98	7	26	47	102
	LA-NF	3	50	19	52	94	4	9	40	98
	LA-F	4	20	21	62	95	9	32	42	98
	NY-NF	5	70	18	81	88	11	7	74	94
	NY-F	6	25	8	81	88	3	8	62	95
	LA-NF	7	65	28	55	95	8	7	40	95
	LA-F	8	23	19	57	92	8	31	41	97
CAPE-21H	LA-NF	1	66	30	58	93	14	7	49	93
	LA-F	2	24	24	72	100	7	23	49	101
	NY-NF	3	74	25	80	92	10	5	85	93
	NY-F	4	27	12	86	98	3	8	70	97
1975 FTP	505C	1	47	25	104	95	28	21	81	91
	867S	2	71	23	73	100	22	11	58	99
	505H	3	54	14	107	98	18	10	82	97
	TOTAL COMPOSITE		60	21	88	98	23	14	69	97
9-FTP *	ENGINE DYNAMOMETER		18	102	30	109	2	2	31	118
9-EPA *	ENGINE DYNAMOMETER		10	43	38	91	<1	<1	31	95

*Based on units of g/kW hr for emission and kg/kW hr for fuel consumption

Relative to fuel consumption, based on units of kg/kWh there was no apparent correlation between the fuel consumption values for the nine-mode FTP and any of the transient cycles. With the nine-mode EPA, there was insufficient data to determine whether any significant correlation exists between the nine-mode results and the transient results.

In summary, some of the findings in these Phase III evaluations are as follows:

1. The Chevrolet C-60 truck at half payload could acceptably follow the CAPE-21 driving cycles used in this project. The prescribed rate of acceleration could not be attained in a few areas, but such deviations were minor.

2. In the transient evaluations, the emissions and fuel consumption were generally lower with the emission control system than with the baseline configuration. In most of the transient driving cycles the reductions in emissions were very significant.

3. With the single exception of CO emissions, when using the emissions control system without the catalyst, the reduction in emissions and fuel consumption relative to baseline were generally greater in the nine-mode procedures than in the transient cycles. It should be noted that the engine was optimized for the nine-mode procedure.

4. As the HC emissions were controlled to lower levels, the HC spikes that generally occurred during transient operation became a significant factor in total cycle HC emissions.

5. There were no readily apparent direct relationships between the nine-mode procedures results and the results obtained with the transient driving cycles.

C. Visual Examination of the Exhaust Thermal Reactors

After completion of the evaluations on the chassis dynamometer, the thermal reactors were visually examined. Some cracks were noted in the inner can of the reactor used on the right exhaust bank in approximately the same area in which severe cracking occurred during the Phase II evaluations. Overall condition of these thermal reactors can not be readily determined, however, without dissection.

During these Phase III evaluations, exhaust thermal reactor exit temperatures were recorded during all evalutions. The temperatures were determined at the axial centerline at the exit from the units. Recommended maximum operating temperature was 1038°C; with allowance for very short-term operation up to 1066°C. During a portion of the CAPE-21 LA-F cycle, the temperature consistently approached the 1066°C limit. Therefore, these thermal reactors were being operated at the very limit of their maximum specified exit temperature. There was no apparent exceeding of these temperature limits.

The cracks in the inner reactor occurred in the area in which exhaust from all applicable cylinders passes prior to being directionally redirected before final passage and exit from the thermal reactors. Therefore, the temperature in the area in which the cracks occurred could possibly have been somewhat higher than 1066°C.

A primary conclusion is that the thermal reactor operating temperatures or conditions which occur with this system appear to be rather severe and some reduction of the system operating temperature or severity of operation may be required. One potential approach would be to limit the amount of air injection during high speed WOT operation, or during any other condition at which high thermal reactor temperatures or thermal stresses occur. Such an approach would be expected to result in some increase in CO emissions. Other emissions could also be affected.

VI. RECOMMENDATIONS

This project has resulted in a significant reduction in emissions and fuel consumption for a HD gasoline engine. These reductions were achieved without degradation of engine operation and performance. The thermal reactors, however, deteriorated under HD engine operation and need reduction in maximum interior reactor temperatures or possibly further design improvement. The goals of this project were met by means of electronic fuel injection, exhaust gas recirculation and thermal reactors.

Throughout this project, a nine-mode procedure was used for optimizing and demonstrating emission and fuel economy targets. Current plans of the EPA are to replace the steady-state nine-mode engine test with a transient engine test for 1983. The transient cycle, based on the CAPE-21 HD "Truck Driving Pattern and Use Survey," may include operation from a cold engine start after overnight soak as is the current case for LD vehicles. As discussed in this report, the operation of the same vehicle and engine on the chassis dynamometer transient cycles did not give the same improvement, relative to the uncontrolled engine, as achieved in the nine-mode evaluations. In short, a correlation between the two distinctly different procedures has not been possible, to date.

With the above concluding statements of the three-phase project, several suggestions are offered for consideration. These suggestions were prepared in accordance with the requirements of Task IV in the Phase III Scope of Work.

1. Future gasoline engine HD control technology evaluations should be based on the transient procedure planned for 1983. This means that parametric and system optimization should be performed using the latest EPA cycles representing road operation. The nine-mode FTP should be employed on a selected basis to "bridge" advanced system levels to those by the current procedure.

2. Currently, the transient cycles under study for 1983 involve four separate nominal five-minute segments representing freeway and non-freeway operation in Los Angeles and New York City. It would be helpful to have weighting factors for each segment in order to obtain a total composite value. A composite self-weighting driving cycle that represents road operation would be even more useful. Its main importance would be in evaluation of currently unregulated emissions such as sulfate, particulate, polynuclear aromatics, partially oxygenated materials, etc. The sample period of five minutes is generally insufficient for trap or filter collection of the unregulated emissions of potential interest.

3. The importance of a "cold start" segment of the transient procedure needs to be established. For the gasoline truck evaluated during this project, high rates of HC and CO were produced during the first few minutes of

operation following "cold start" after overnight soak. In this respect, the emissions characteristics of the HD gasoline resembled that of the LD vehicle. The frequency of "cold start" per mile of operation for HD gasoline vehicles, however, may be different from that for passenger cars.

4. The CAPE-21 transient test cycles used in this project were for chassis dynamometer operated vehicles. Transient test cycles for gasoline (and diesel) HD engines have been derived from the CAPE-21 project for engine dynamometer type testing. The engine cycles are understood to be one of the methods under consideration for 1983. It is uncertain, at this time, whether the same engine would give the same emission levels when operated in a truck by the chassis cycles as when operated on an engine dynamometer. To the extent that the chassis dynamometer vehicle testing will be useful, some indication of correlation would be beneficial.

5. For the 1983 transient procedure, it is expected that mass emissions will be expressed in terms of grams per cycle kW-hr. The major problem in performing equivalent chassis dynamometer testing, is the inability to continuously measure the power produced at the engine flywheel. Other items of concern are the determinations of appropriate road-load and inertia simulation characteristics. At the present time, there is no simple solution to any of these concerns. A chassis dynamometer test procedure would be very useful in surveillance or development of in-use emissions factors. Correlations per recommendation 4 would be needed, however.

6. Future gasoline HD emission control technology evaluations should incorporate the latest advances from gasoline LD vehicles. An example of a recent system which appears to have potential application to HD vehicles is the 3-way catalyst with feedback carburetor. A project could be structured around this and other developments that would continue to demonstrate the ability to reduce emissions and maintain fuel economy of HD gasoline powered vehicles. Such additional experimental effort could profit from recommendations 1-5.

7. Future emission evaluations of engines and control systems should incorporate a provision for determination of unregulated emissions. These include but are not necessarily limited to particulate, sulfate, polynuclear aromatics, organic fraction of particulate, and aldehydes. Such determination should be limited to the base engine versus the optimized engine.

8. As newer gasoline emission control approaches materialize, it may be instructive to evaluate the effect of malfunction conditions on both regulated and unregulated emissions. Such a project could resemble that being performed currently with light-duty gasoline vehicles under EPA contracts 68-03-2499 and 68-03-2588. In addition to those items mentioned in recommendation 7, sulfides, ammonia, organic amines, hydrogen cyanide, and possibly nickel carbonyl may be of interest. This work could utilize the methodology and qualification efforts under the two previously mentioned contracts.

9. The control equipped engine employed in this project was optimized by the nine-mode procedure. With the advent of the transient cycles, further investigations are not recommended until the system has been re-optimized to the CAPE-21 transient cycles. Recommendations 1-5 covered the transient cycle needs as they would affect future work with this engine for either unregulated (recommendation 7) or malfunction (recommendation 8) emissions.

10. It is possible to operate HD gasoline trucks on a chassis dynamometer by the 1975 FTP for LD vehicles. The speed-time trace, however, is very demanding of the vehicle and it normally cannot follow the rapid acceleration rates. Further use of the 1975 LD-FTP is not recommended for HD vehicles unless the speed-time trace is "slowed-down". By slowing the chart speed of the driver's aid, by 10 to 20 percent, the cycle would be more driveable and could possibly approach that which would occur on the road.

LIST OF REFERENCES

1. Urban, Charles M. and Karl J. Springer, "Heavy Duty Fuel Economy Program Phase II - Evaluation of Emission Control Technology Approaches." Final Report No. EPA-460/3-77-010 to the Environmental Protection Agency under Contract No. 68-03-2220, July 1977.

2. Ingalls, Melvin N. and Robert L. Mason, "Heavy-Duty Fuel Economy Program - Phase I, Specific Analysis of Certain Existing Data." Final Report No. EPA-460/3-77-001 to the Environmental Protection Agency under Contract 68-03-2220, January 1977.

3. Environmental Protection Agency, "Recommended Heavy-Duty Gasoline Instrumentation and Test Procedures, July 11, 1975. (This procedure, with some modifications, was included in the proposed rules dated May 24, 1976 and in the final rules dated September 8, 1977).

   - Federal Register, Vol. 41, No. 101, Environmental Protection Agency, "Proposed Rules for Heavy-Duty Engines," May 24, 1976.

   - Federal Register, Vol. 42, No. 174, Environmental Protection Agency, "Certification and Test Procedures for Heavy-Duty Engines for 1979 and Later Model Years," September 8, 1977.

4. Urban, Charles M. and Karl J. Springer, "Study of Emissions from Heavy-Duty Vehicles." Final Report No. EPA-460/3-76-012 to the Environmental Protection Agency under Contract 68-03-2147, May 1976.

5. Code of Federal Regulations, Title 40, Chapter 1, Part 85, Subpart A, Sections applicable to 1977 Model Year Light-Duty Vehicles.

6. Code of Federal Regulations, Title 40, Chapter 1, Part 85, Subpart H, Sections applicable to 1975 Model Year Heavy-Duty Engines.

7. Letter from Andrew Kaupert, Environmental Protection Agency, to Charles Urban, Southwest Research Institute, dated November 28, 1977.

8. ASTM Special Publication 315F, "Multi-Cylinder Test Sequence for Evaluating Automotive Engine Oils."

APPENDICES

A. General Information
B. Engine Inspection Data
C. Engine Dynamometer Nine-Mode Results
D. Chassis Version Nine-Mode FTP Results
E. Chassis Transient Test Results - SC[a]
F. Chassis Transient Test Results - ECS[b]
G. Chassis Transient Test Results - ECSwC[c]

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[a]Standard Configuration
[b]Emission Control System
[c]Emission Control System with Catalyst

APPENDIX A

GENERAL INFORMATION

Table A-1 Description of Engine and Components
Table A-2 Explanation of Nine-Mode FTP Computer Printout Sheets
Table A-3 Explanation of Nine-Mode EPA Computer Printout Sheets

TABLE A-1. DESCRIPTION OF ENGINE AND COMPONENTS

Baseline Components	Part Number	Make or Model No.	Description or Serial No.
Engine	343678	C-60	V0827TMX
Carburetor[a]	7044134	Rochester	N6606
Distributor[b]	1111364	Delco Remy	4H12
Air Filter	6487276	-----	-----
Alternator	1100543	-----	-----
Starter	1108362	-----	-----
Spark Plugs	6470779	R-44T	-----
Plug Wires	8912437	-----	-----
Optimization Components			
Electronic Fuel Injection	ECU-1607250	Bendix	Similar to 1975 Cadillac System
Thermal Reactors[c]	-----	GM	Phase 5 Assembly
Back Pressure EGR Valves	-----	MX-4809	-----
Air Pump[c]	L-73641	Saginaw	254863V
Air Filter	698364	-----	-----
Diverter Valve	7029295	-----	-----
HEI Distributor	1112880	-----	-----
Spark Plugs	-----	R44TX	-----
HEI Plug Wires	8908551	-----	-----
Catalytic Converter	PTX 7.25-2-3MOD3	Engelhard	6344002

[a] 2-Barrel
[b] Has centrifugal but does not have vacuum advance
[c] Experimental Unit

TABLE A-2. EXPLANATION OF NINE-MODE FTP
COMPUTER PRINTOUT SHEETS

COLUMN EXPLANATION

Column	Column Title	Explanation
1	MODE	Mode number and manifold vacuum
2	AS MEASURED HC-FID	Measured hydrocarbon emissions, ppmC
3	AS MEASURED CO	Measured carbon monoxide emissions in percent
4	AS MEASURED CO_2	Measured carbon dioxide emissions in percent
5	AS MEASURED NO_x-CL	Measured oxides of nitrogen emissions in ppm NO_x
6	TOTAL CARBON	The percentage of exhaust gas that is carbon containing gas
7	FUEL G/HR	Engine Fuel consumption in Grams/Hr
8	CALCULATED G/HR HC	Hydrocarbon emissions in Grams/Hr calculated from measured HC (HC by FID corrected to a dry gas basis)
9	CALCULATED G/HR CO	Carbon monoxide emissions in Grams/Hr calculated from measured CO
10	CALCULATED G/HR NO_x	Oxides of nitrogen emissions in Grams/Hr calculated as NO_2 from measured NO_x
11	WT. FACT.	Weighting factor for each mode
12	WEIGHTED G/HR HC-FIC	Hydrocarbon emissions in Grams/Hr times the weighting factor
13	WEIGHTED G/HR CO	Carbon monoxide emissions in Grams/Hr times the weighting factor
14	WEIGHTED G/HR NO_x-CL	Oxides of nitrogen emissions as NO_2 Grams/Hr times the weighting factor
15	KW	Engine dynamometer power in kilowatts
16	HP	Engine dynamometer power in horsepower

TABLE A-2 (Cont'd). EXPLANATION OF NINE-MODE FTP COMPUTER PRINTOUT SHEETS

LINE EXPLANATION	
1st Line	Table number and Title
2nd Line	
ENGINE - (X)	SwRI engine identification number
TEST - (X)	Test number. Tests numbered sequentially.
RUN - (X)	Run number of a specific test
BETWEEN RUN & DATE	Brief description of engine configuration
(XX) - (XX) - (XX)	Date in month, day and year
K = (X.XXX)	Humidity correction factor for cycle composite NO_2. $K = .634 + .00654\ H - .000022\ H^2$. Where H = absolute humidity ingrains/lb DA
HUM = (XX.X)G/KG	Absolute humidity in grams/kilogram
Line Starting CYCLE COMPOSITE	Grams/kw-hr for cycle, summation of the weighted emission for each mode divided by the summation of the weighted power for each mode, i.e. $\frac{\Sigma(\text{Emission x W.F.})}{\Sigma(\text{kw x W.F.})}$
AVERAGE SUM-(COMPOSITE VALUES FOR CYCLES 1 & 2)	$\frac{\text{SUM (Cycle 1) + SUM (Cycle 2)}}{2}$
AVERAGE SUM-(COMPOSITE VALUES FOR CYCLES 3 & 4)	$\frac{\text{SUM (Cycle 3) + SUM (Cycle 4)}}{2}$
FOUR CYCLE COMPOSITE	Composite of all four cycles in Grams/kW-hr and (grams/bhp-hr) using formula shown
CORRECTED NO_2	Four cycle composite NO_x as NO_2 times the humidity correction factor, K
SFC	Calculated in the same manner as the emissions using the formulas given for CYCLE COMPOSITE EMISSIONS

TABLE A-3. EXPLANATION OF NINE-MODE EPA COMPUTER PRINTOUT SHEETS

COLUMN EXPLANATION (UPPER COLUMNS)

Column	Column Title	Explanation
1	MODE	Mode number and % of max. torque
2	AS MEASURED HC-FID	Measured hydrocarbon emissions in ppmC
3	AS MEASURED CO	Measured carbon monoxide emissions in percent
4	AS MEASURED CO_2	Measured carbon dioxide emissions in percent
5	AS MEASURED NO_x-CL	Measured oxides of nitrogens emissions in ppm NO_x
6	TOTAL CARBON	The percentage of exhaust gas that is carbon containing gases
7	FUEL G/HR	Engine fuel consumption in Grams/Hr
8	CALCULATED G/HR HC	Hydrocarbon emissions in Grams/Hr calculated from measured HC (HC by FID corrected to dry gas basis)
9	CALCULATED G/HR CO	Carbon monoxide emissions in Grams/Hr calculated from measured CO
10	CALCULATED G/HR NO_x	Oxides of nitrogen emissions in Grams/Hr calculated as NO_2 from measured NO_x and humidity corrected using factor K
11	WT. FACT.	Weighting factor for each mode
12	WEIGHTED G/HR HC-FID	Hydrocarbon emissions in Grams/Hr times the weighting factor
13	WEIGHTED G/HR CO	Carbon monoxide emissions in Grams/Hr times the weighting factor
14	WEIGHTED G/HR NO_x-CL	Oxides of nitrogen emissions as NO_2 Grams/Hr times the weighting factor
15	CKW	Corrected engine dynamometer power in kilowatts
16	VAC.MM	Measured manifold vacuum in millimeters of mercury

TABLE A-3 (Cont'd). EXPLANATION OF NINE-MODE EPA COMPUTER PRINTOUT SHEETS

COLUMN EXPLANATION (LOWER COLUMNS)

Column	Column Title	Explanation
1	MODE	Mode number and % of max. torque
2	ID	Defined at bottom of the printout sheet when column is used
3	MV	Manifold vacuum in inches of mercury
4	CHP	Corrected brake horsepower
5	CTQ	Corrected torque in ft-lbs
6	FC	Fuel consumption in lbs/hr
7	BSFC	Brake specific fuel consumption in lbs/bhp-hr
8	$BSNO_x$	Brake specific NO_x as NO_2 emissions in b/bhp-hr
9	F/A	Computed dry fuel to air ratio (computed using HC and CO emission rates)
10	SFC KG/KW HR	Specific fuel consumption in kg/kw-hr
11	RPM	Engine speed in revolution per minute
12	CALC A/F	Inverse of the F/A in column 9
13-17	PERCENT OF TOTAL	Percent contribution of that mode to the total weighted composite value for that cycle

LINE EXPLANATION

1st Line — Table number and Title

2nd Line

ENGINE - (X)	SwRI engine identification number
TEST - (X)	Test number. Tests numbered sequentially
RUN - (X)	Run number of a specific test

TABLE A-3 (Cont'd). EXPLANATION OF NINE-MODE EPA COMPUTER PRINTOUT SHEETS

LINE EXPLANATION	
2nd Line (Cont'd)	
(XX) - (XX) - (XX)	Date in month, day and year
BETWEEN DATE & K	Brief description of engine configuration
K = (X.XXX)	Humidity correction factor for cycle composite NO_2. $K = .634 + .00654\ H - .0000222\ H^2$. Where H = absolute humidity in grains/lb DA
HUM = (XX.X) G/KG	Absolute humidity in grams/kilogram
Line Starting CYCLE COMPOSITE	Grams/kW-hr for cycle, summation of the weighted emission for each mode divided by the summation of the weighted power for each mode, i.e. $\frac{\Sigma(\text{Emission} \times \text{W.F.})}{\Sigma(\text{kW} \times \text{W.F.})}$
AVERAGE SUM - (COMPOSITE VALUES FOR CYCLES 1 AND 2	$\frac{\text{SUM (Cycle 1)} + \text{SUM (Cycle 2)}}{2}$
AVERAGE SUM - (COMPOSITE VALUES FOR CYCLES 3 AND 4	$\frac{\text{SUM (Cycle 3)} + \text{SUM (Cycle 4)}}{2}$
FOUR CYCLE COMPOSITE	Composite of all four cycles in Grams/kW-hr and (grams/bhp-hr) using formula shown
SFC	Calculated in the same manner as the emissions using the formulas given for CYCLE COMPOSITE EMISSIONS

APPENDIX B

ENGINE INSPECTION DATA

Table B-1 Engine Deposit Rating
Table B-2 Engine Sludge and Varnish
Table B-3 Engine Wear Measurements

TABLE B-1. VISUAL RATING OF ENGINE DEPOSITS AND ENGINE INTERIOR
METRIC UNITS-MILLIMETRE

Engine: 350 Chevrolet HD with Emission Control System
Engine Usage: 468 hours of Optimization, 1500 hours Durability and a Driveability Evaluation
SwRI Project: 11-4311, EPA Contract No. 68-03-2220
Date: September 11, 1977

Spark Plugs (New at Start of Driveability Evaluation)

All spark plugs had thin gray deposit on electrode, thin black deposit on body, and 1.52 mm gap.

Combustion Chamber Interior Appearance

Cylinder	Deposit
1L	Black colored carbonaceous deposit over most of area; 13 mm by 76 mm area at the extremity of the squish area was essentially free of deposits; deposits were generally 0.13 to 0.25 mm thick over most of the area; several small patches (up to 320 sq mm total area) of deposits around exhaust valve seat 0.51 mm thick.
3L	Similar to 1L, except area essentially free of deposits at extremity of squish area was about 10 mm by 50 mm and total area with deposits over 0.51 mm thick was about 645 sq mm.
5L	Black colored carbonaceous deposits 0.13 mm or less in thickness over most of area; deposits at extremity of squish area were 0.13 to 0.25 mm thick; approximately 645 sq mm of deposits around exhaust valve seat were gray colored and 0.25 to 0.38 mm thick.
7L	Black colored carbonaceous deposits 0.13 to 0.25 mm thick over entire area; deposits were generally the thicker value around exhaust valve seat.
2R	Same as 3L.
4R	Similar to 7L, except 320 sq mm of deposit was about 0.38 mm thick.
6R	Same as 4R.
8R	Same as 4R.

Exhaust Valve Underheads and Stems

Cylinder	Deposit
1L	Hard gray deposit approximately 0.13 mm thick; flaking off on 25 to 50 percent of area.
3L	Same as 1L.
5L	Same as 1L.
7L	Same as 1L.
2R	Same as 1L.

TABLE B-1 (Cont'd.) VISUAL RATING OF ENGINE DEPOSITS AND ENGINE INTERIOR
METRIC UNITS-MILLIMETRE

4R	Same as 1L.
6R	Same as 1L.
8R	Same as 1L.

Intake Valve Underheads and Stems

Cylinder	Deposit
1L	Hard black carbonaceous deposits up to 1.6 mm thick on valve tulip; less than 0.13 mm thick on stem.
3L	Similar to 1L, except deposit up to 0.25 mm on stem.
5L	Hard black carbonaceous deposits up to 3.2 mm thick on valve tulip; 0.25 to 0.38 mm on stem.
7L	Similar to 5L, except deposits less than 0.25 mm on stem and less total deposits on tulip.
2R	Same as 3L.
4R	Hard black carbonaceous deposits up to 2.4 mm thick on valve tulip; 0.13 to 0.38 mm thick deposits on stem.
6R	Same as 5L.
8R	Same as 3L.

Intake Port at Valve Opening

Cylinder	Deposit
1L	Black carbonaceous deposits up to 0.8 mm thick near seat; essentially clean in area around valve stem boss.
3L	Same as 1L.
5L	Black carbonaceous deposits up to 1.6 mm thick over an area 13 mm by 25 mm near seat; thin black deposits around valve stem boss.
7L	Same as 1L.
2R	Same as 1L.
4R	Black carbonaceous deposits up to 2.4 mm thick over an area about 13 mm by 25 mm near seat; only thin film over most of remaining area.
6R	Same as 4R.
8R	Same as 5L.

Exhaust Port at Valve Opening

Cylinder	Deposit
1L	Black carbonaceous deposits less than 0.13 mm thick over entire surface.
3L	Black carbonaceous deposits up to 0.25 mm thick over most of surface; patches of light gray deposit up to 1.6 mm thick and 320 sq mm total area around valve stem boss.
5L	Same as 1L.
7L	Same as 3L.
2R	Same as 1L.
4R	Black carbonaceous deposits less than 0.25 mm thick near seat; gray colored deposits from 0.25 mm to 1.6 mm thick over remainder of area.

TABLE B-1 (Cont'd.) VISUAL RATING OF ENGINE DEPOSITS AND ENGINE INTERIOR
METRIC UNITS-MILLIMETRE

6R	Same as 3L.
8R	Same as 3L.

Intake Ports in Head From Manifold

All coated with dull black deposit, hard, about 0.13 to 0.25 mm thick.

Exhaust Ports in Head to Manifold*

Cylinder	Deposit
1L	Light gray deposit, hard, about 0.13 to 0.25 mm thick.
3L	Light gray deposit, hard, ranging from 0.13 to 1.6 mm thickness; 0.8 to 1.6 mm thick over about third of the total surface area of port liner.
5L	Similar to 1L, except less than 0.13 mm thick.
7L	Same as 1L.
2R	Similar to 3L, except less than 0.8 mm thick.
4R	Same as 1L.
6R	Same as 1L.
8R	Similar to 1L, except up to 0.38 mm thick.

* stainless steel exhaust port liners

Piston Tops

Cylinder	Deposit
1L	Flaky black carbonaceous deposits from 0.13 to 1.02 mm over about three fourths of total surface area; about one fourth of surface area near perimeter was essentially clean.
3L	Flaky black carbonaceous deposits from 0.13 to 0.76 mm over entire surface, except for very small areas where deposit had flaked off.
5L	Similar to 3L except maximum deposit thickness was 0.38 mm
7L	Same as 3L.
2R	Same as 3L.
4R	Similar to 3L, except more areas where the deposit had flaked off.
6R	Same as 3L.
8R	Similar to 1L, except for less area that was essentially clean and small area of deposit up to 1.27 mm

Intake Manifold Ports

All ports coated with dull black deposit, hard, about 0.13 to 0.25 mm thick.

TABLE B-1 (Cont'd.) VISUAL RATING OF ENGINE DEPOSITS AND ENGINE INTERIOR
METRIC UNITS-MILLIMETRE

Exhaust Thermal Reactor Inlet Ports

Cylinder	Deposit
1L	Light gray deposit, hard, 0.25 to 0.76 mm thick; most deposit had flaked off after 25 mm from entrance.
3L	Same as 1L.
5L	Light gray deposit, hard, up to 0.13 mm thick; no flaking off.
7L	Similar to 5L, except 0.13 to 0.25 mm thick.
2R	Similar to 1L, except very little had flaked off.
4R	Same as 7L.
6R	Same as 1L.
8R	Same as 7L.

EFI Throttle Body

Soft, oily, sludge-like deposit approximately 0.25 mm thick coating on bottom of throttle plate and on lower throat area of throttle body.

EGR Valves

Light gray deposit on orifice approximately 0.13 mm thick; dark gray to black deposit about 0.13 mm thick on pintle and exit port.

Thermal Reactor Exits

Essentially no deposits.

TABLE B-2. SUMMARY OF APPLICABLE PORTIONS OF SEQUENCE VC RATINGS

Note: Ratings are 1 through 10, with 1 as dirty or severe and 10 as clean.

	Rating
SLUDGE	
Left Rocker Arm Cover	9.6
Right Rocker Arm Cover	9.7
Underside of Intake Manifold	9.8
Oil Pan	9.8
Left Valve Deck	9.9
Right Valve Deck	9.9
Push Rod Chamber	9.8
Timing Gear Cover	9.6
VARNISH	
Piston Skirts	7.9
Valve Lifters	6.7
DEPOSITS	
Intake Valves	7.3
CLOGGING	Percent
Oil Rings	0
Oil Screen	0

TABLE B-3. SUMMARY OF MEASUREMENTS ON THE ADVANCED TECHNOLOGY CONFIGURED ENGINE - METRIC UNITS-MILLIMETRE

CYLINDER BORE DIAMETER - MAXIMUM

Cylinder Number	Location	
	Top	Bottom
4, 5 & 6	101.68-101.70	101.65-101.68
1, 2 & 8[a]	101.75	101.70-101.75
3[b]	101.90	101.80
7	101.88	101.73

[a]On cylinders 1, 2 and 8 the compression rings were lined up and a longitudinal ridge of metal remained on the cylinder wall in the area of the lined up ring gaps. The ridge in each cylinder was approximately 0.025 to 0.076 mm high.

[b]Cylinder 3 had a groove approximately 0.051 mm deep by 2.54 mm wide.

Note: If the cylinders have less than 0.127 mm taper or wear they can be reconditioned with a hone and fitted with 0.025 mm oversize pistons.

PISTON DIAMETER - MINIMUM

Piston Number	Location		
	Top	Middle	Skirt
4 & 5	101.52-101.55	101.50-101.52	101.55-101.57
2, 6 & 8	101.52-101.55	101.47	101.55-101.57
1, 3 & 7	101.52-101.55	101.45	101.52-101.55

TABLE B-3 (Cont'd). SUMMARY OF MEASUREMENTS ON THE ADVANCED TECHNOLOGY CONFIGURED ENGINE - METRIC UNITS-MILLIMETRE

PISTON RING GAP

As measured in a cylinder bore of 101.63 mm diameter.

Piston Number	Ring: Compression Top	Ring: Compression Middle	Ring: Oil Assembly Upper	Ring: Oil Assembly Lower
1	0.88	1.75	2.51	1.75
2	0.51	1.30	1.73	1.50
3	1.32	3.84	3.86	2.46
4	0.94	1.70	2.13	1.91
5	0.76	1.45	2.13	1.91
6	0.89	1.24	2.06	1.85
7	1.70	3.86	3.86	2.46
8	0.64	1.83	1.70	2.13

PISTON RING THICKNESS - MINIMUM

Piston Number	Ring: Compression Top	Ring: Compression Middle	Ring: Oil Assembly Upper	Ring: Oil Assembly Lower
1	1.91	1.96	0.64	0.66
2	1.91	1.98	0.64	0.64
3	1.73	1.93	0.64	0.64
4	1.93	2.03	0.66	0.66
5	1.89	1.96	0.66	0.66
6	1.93	1.96	0.64	0.64
7	1.85	1.89	0.61	0.66
8	1.91	1.96	0.64	0.64

PISTON RING DIAMETRICAL WIDTH - MINIMUM

Piston Number	Ring: Compression Top	Ring: Compression Middle	Ring: Oil Assembly Upper	Ring: Oil Assembly Lower
1	4.83	4.62	3.81	3.48
2	4.93	4.75	3.81	3.94
3	4.29	4.50	2.64	3.00
4	4.67	4.60	3.68	3.86
5	4.85	4.72	3.89	3.53
6	4.90	4.75	3.86	3.99
7	3.81	4.70	2.69	3.48
8	4.85	4.75	2.84	3.94

TABLE B-3 (Cont'd). SUMMARY OF MEASUREMENTS ON THE ADVANCED TECHNOLOGY CONFIGURED ENGINE - METRIC UNITS-MILLIMETRE

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	Measured	Original Specifications, minimum
Main 1 & 3	62.179	62.189
2 & 4	62.167	62.189
5	62.179	62.177
Connecting Rod 1-6	53.289	53.315
7[C]	53.264	53.315
8[C]	53.238	53.315

[C] surfaces were grooved

CAMSHAFT

Bearing Surfaces - All were 47.473 ± 0.005 mm Dia

Across Lobes

1 & 2	38.86
7, 8, 9 & 10	38.81
15 & 16	38.76
3, 4 & 5	39.24
6 & 12	39.19
11 & 12	39.17
14	39.14

APPENDIX C

ENGINE DYNAMOMETER NINE-MODE RESULTS

TABLE C-1	Summary of the Results
TABLES C-2 through C-8	Nine-Mode FTP Results
TABLES C-9 through C-17	Nine-Mode EPA Results

TABLE C-1. ENGINE DYNAMOMETER NINE-MODE EVALUATIONS

Test No.	Run No.	Type Test	Description	Gram/kW Hr HC	CO	NO_x	$HC+NO_x$	kG/ kw hr SFC
2001	1	9-FTP	Phase III Baseline After Overhaul	5.251	18.371	12.723	17.974	0.475
	2			5.742	18.888	12.563	18.305	0.467
	3			4.922	20.953	12.552	17.474	0.465
			Average	5.31	19.40	12.61	17.92	0.469
			Standard Deviation	0.41	1.37	0.10	0.42	0.005
2004	2	9-FTP	Emissions Control System	1.016	20.144	3.824	4.840	0.512
	3			0.943	19.543	3.813	4.756	0.508
			Average	0.98	19.83	3.82	4.80	0.510
			Standard Deviation	0.05	0.43	0.01	0.06	0.003
2005	1	9-FTP	Emissions Control System with Cat.	0.109	0.625	4.137	4.246	0.553
	2			0.123	0.258	3.745	3.868	0.554
			Average	0.12	0.44	3.94	4.06	0.554
			Standard Deviation	0.01	0.26	0.28	0.27	0.001
2002	1	9-EPA	Phase III Baseline After Overhaul	5.010	26.241	13.163	18.173	0.429
	2			5.704	28.218	13.891	19.595	0.429
	3			5.603	37.632	12.245	17.848	0.432
			Average	5.44	30.70	13.10	18.54	0.430
			Standard Deviation	0.37	6.09	0.82	0.93	0.002
2007	1	9-EPA	Emissions Control System	0.477	13.377	4.079	4.557	0.390
	2			0.510	13.150	4.928	5.438	0.394
				0.566	13.359	4.934	5.000	0.394
			Average	0.52	13.30	4.65	5.00	0.393
			Standard Deviation	0.05	0.13	0.49	0.44	0.002
2006	1	9-EPA	Emissions Control System with Cat.	0.024	0.092	4.478	4.502	0.410
	2			0.023	0.198	3.522	3.545	0.406
				0.024	0.047	4.081	4.105	0.409
			Average	0.02	0.11	4.03	4.05	0.408
			Standard Deviation	0.00	0.08	0.48	0.48	0.002

TABLE C-2. MASS EMISSIONS BY NINE-MODE FTP -METRIC UNITS

ENGINE-20 TEST-2001 RUN-1 BASELINE AFTER OVERHAUL10-17-77 K = .982 HUM = 10.0 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NO2	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NO2-CL	KW	HP
1 IDLE	3086	.390	12.73	67	13.929	1837	92	108	3	.232	9.8	25	.7	0	0
2 16 MG	329	.230	13.39	910	13.602	8596	20	299	86	.077	1.6	23	4.6	13	18
3 10 MG	687	.280	13.84	1572	14.189	13336	65	532	991	.147	9.5	78	78.1	37	49
4 16 MG	262	.290	13.71	990	14.026	8596	16	369	100	.077	1.2	28	7.7	13	18
5 19 MG	233	.060	12.73	195	12.813	5829	11	96	22	.057	.6	3	1.3	0	0
6 16 MG	253	.270	13.59	990	13.885	8596	14	338	101	.077	1.2	26	7.8	13	18
7 3 MG	695	.210	13.71	2085	13.990	18325	91	556	907	.113	10.3	63	102.5	60	81
8 16 MG	271	.320	13.84	590	14.182	8596	16	392	109	.077	1.3	30	8.4	13	18
9 C.T.	19291	.380	10.01	37	12.319	1882	295	117	2	.143	42.1	17	.3	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											9.8	18	12.6		
1 IDLE	3512	.960	12.49	68	13.901	1837	98	128	3	.232	11.3	30	.7	0	0
2 16 MG	397	.260	13.47	960	13.770	8596	25	328	95	.077	1.9	25	7.3	13	18
3 10 MG	651	.270	13.84	1561	14.175	13336	61	513	988	.147	9.0	75	71.7	37	49
4 16 MG	235	.250	13.84	900	14.114	8596	14	308	101	.077	1.1	24	7.8	13	18
5 19 MG	251	.050	12.86	195	12.925	5829	11	96	22	.057	.6	3	1.2	0	0
6 16 MG	244	.260	13.71	960	13.999	8596	15	323	99	.077	1.2	25	7.2	13	18
7 3 MG	650	.200	13.71	2122	13.975	18325	85	530	929	.113	9.6	60	104.9	60	81
8 16 MG	226	.260	13.99	925	14.123	8596	14	320	106	.077	1.1	25	8.2	13	18
9 C.T.	22468	.380	10.22	37	12.898	1882	329	112	2	.143	47.1	16	.3	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											5.1	17	12.9		
1 IDLE	3296	.960	12.37	71	13.260	1837	60	129	3	.232	13.9	30	.8	0	0
2 16 MG	339	.220	13.47	945	13.723	8596	21	390	92	.077	1.6	26	7.1	13	18
3 10 MG	687	.290	13.84	1599	14.199	13336	65	550	997	.147	9.5	81	73.1	37	49
4 16 MG	235	.250	13.59	990	13.863	8596	15	313	101	.077	1.1	24	7.8	13	18
5 19 MG	193	.060	12.85	155	12.924	5829	7	55	23	.057	.4	3	1.3	0	0
6 16 MG	244	.260	13.59	990	13.874	8596	15	325	101	.077	1.2	25	7.8	13	18
7 3 MG	704	.220	13.59	2159	13.880	18325	93	587	996	.113	10.5	66	106.9	60	81
8 16 MG	199	.210	13.71	560	13.990	8596	12	262	115	.077	.9	20	8.8	13	18
9 C.T.	23740	.390	10.01	96	12.729	1882	351	102	2	.143	50.2	15	.3	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											5.5	18	13.2		
1 IDLE	3293	.960	12.37	67	13.159	1837	96	130	3	.232	10.7	30	.7	0	0
2 16 MG	329	.390	13.47	960	13.898	8596	29	426	95	.077	1.8	33	7.3	13	18
3 10 MG	660	.310	13.89	1599	14.216	13336	62	587	982	.147	9.1	86	70.9	37	49
4 16 MG	262	.270	13.59	935	13.886	8596	16	338	110	.077	1.2	26	8.5	13	18
5 19 MG	152	.050	12.73	135	12.795	5829	7	96	21	.057	.4	3	1.2	0	0
6 16 MG	235	.220	13.59	910	13.833	8596	15	276	105	.077	1.1	21	8.1	13	18
7 3 MG	696	.290	13.71	2104	14.020	18325	91	763	910	.113	10.2	86	102.8	60	81
8 16 MG	190	.210	13.71	530	13.939	8596	12	262	117	.077	.9	20	9.0	13	18
9 C.T.	24032	.280	10.01	94	12.693	1882	357	84	3	.143	51.0	12	.9	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											5.3	20	12.9		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)----------											4.9	18	12.8		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)----------											5.9	19	13.0		

FOUR CYCLE COMPOSITE =

HC- FID 0.35(4.9) + 0.65(5.4) = 5.251 G/ KW HR (3.916 GB)

CO- NDIR 0.35(17.7) + 0.65(18.7) = 18.371 G/ KW HR (13.699 GB)

NO2-CL 0.35(12.8) + 0.65(13.0) = 12.956 G/ KW HR (9.661 GB)

CORRECTED NO2 = 12.723 G/ KW HR (9.488 GB)

SFC = .975 KG/ KW HR (.781 GB)

TABLE C-3. MASS EMISSIONS BY NINE-MODE FTP -METRIC UNITS

ENGINE-20 TEST-2001 RUN-2 BASELINE AFTER OVERHAUL10-17-77 K = .997 HUM = 10.6 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NO2	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NO2-CL	KW	HP
1 IDLE	9139	.270	12.02	56	12.703	1860	61	80	3	.232	14.0	19	.6	0	0
2 16 MG	933	.280	13.97	920	13.743	8982	27	348	86	.077	2.0	27	6.6	13	18
3 10 MG	793	.320	13.97	1599	14.369	13290	69	598	976	.147	10.1	88	69.9	37	49
4 16 MG	262	.230	13.71	480	13.966	8982	16	282	97	.077	1.2	22	7.5	13	18
5 19 MG	81	.050	12.73	125	12.388	5752	4	45	19	.057	.2	3	1.1	0	0
6 16 MG	248	.250	13.59	955	13.865	8982	15	309	92	.077	1.2	24	7.1	13	18
7 3 MG	769	.300	13.89	2008	14.217	18266	99	779	857	.113	11.2	88	96.8	60	81
8 16 MG	249	.340	13.71	500	14.079	8982	15	414	100	.077	1.1	32	7.7	13	18
9 C.T.	28509	.350	10.01	38	13.250	1819	396	97	2	.193	56.6	19	.2	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											6.0	19	12.1		
1 IDLE	9249	.920	12.99	67	13.390	1860	60	118	3	.232	13.9	27	.7	0	0
2 16 MG	361	.390	13.59	930	13.966	8982	22	917	87	.077	1.7	32	6.7	13	18
3 10 MG	629	.270	13.97	1561	14.308	13290	63	507	981	.147	9.3	74	70.4	37	49
4 16 MG	262	.290	13.71	510	14.026	8982	16	359	102	.077	1.2	27	7.9	13	18
5 19 MG	108	.060	12.97	165	13.091	5752	5	53	29	.057	.3	3	1.9	0	0
6 16 MG	271	.260	13.71	990	13.997	8982	16	318	99	.077	1.3	25	7.6	13	18
7 3 MG	791	.270	13.71	2097	14.059	18266	96	709	883	.113	10.9	80	99.6	60	81
8 16 MG	226	.250	13.89	550	14.113	8982	14	309	110	.077	1.0	23	8.5	13	18
9 C.T.	24988	.320	10.01	91	12.979	1819	370	90	2	.193	52.9	13	.3	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											5.6	19	12.9		
1 IDLE	2861	.390	12.47	71	12.996	1860	91	98	3	.232	9.5	23	.8	0	0
2 16 MG	393	.320	13.59	960	13.950	8982	29	393	93	.077	1.9	30	7.2	13	18
3 10 MG	399	.340	14.09	1615	14.509	13290	68	629	991	.147	10.0	93	72.2	37	49
4 16 MG	271	.250	13.89	510	14.117	8982	16	303	102	.077	1.3	23	7.8	13	18
5 19 MG	139	.050	12.85	190	12.913	5752	6	45	21	.057	.3	3	1.2	0	0
6 16 MG	235	.250	13.71	975	13.983	8982	14	306	96	.077	1.1	24	7.4	13	18
7 3 MG	779	.320	13.89	2113	14.237	18266	99	829	900	.113	11.2	94	101.7	60	81
8 16 MG	217	.230	13.89	580	14.092	8982	13	280	116	.077	1.0	22	8.9	13	18
9 C.T.	28895	.320	9.80	95	13.005	1819	402	90	2	.193	57.5	13	.3	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											5.7	20	12.7		
1 IDLE	3366	.320	12.99	70	13.192	1860	97	105	3	.232	11.0	29	.8	0	0
2 16 MG	329	.280	13.59	970	13.908	8982	23	395	95	.077	1.8	27	7.3	13	18
3 10 MG	335	.280	14.09	1626	14.493	13290	68	520	997	.147	9.9	77	73.0	37	49
4 16 MG	262	.320	13.71	505	14.056	8982	16	390	101	.077	1.2	30	7.8	13	18
5 19 MG	142	.050	12.85	130	12.920	5752	6	45	19	.057	.3	3	1.1	0	0
6 16 MG	252	.260	13.71	510	14.096	8982	16	318	103	.077	1.2	25	7.9	13	18
7 3 MG	751	.250	13.89	2159	14.165	18266	97	651	929	.113	10.9	74	104.9	60	81
8 16 MG	217	.250	13.89	560	14.112	8982	13	309	112	.077	1.0	23	8.6	13	18
9 C.T.	27969	.310	9.80	96	12.857	1819	388	88	2	.193	55.9	13	.3	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											5.7	18	12.9		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)----------											5.8	19	12.2		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 9)----------											5.7	19	12.8		

FOUR CYCLE COMPOSITE =

HC- FID 0.35(5.8) + 0.65(5.7) = 5.742 G/ KW HR (4.282 G/ HP HR)

CO- NDIR 0.35(18.9) + 0.65(18.9) = 18.888 G/ KW HR (14.085 G/ HP HR)

NOX-CL 0.35(12.2) + 0.65(12.8) = 12.600 G/ KW HR (9.396 G/ HP HR)

CORRECTED NO2 = 12.563 G/ KW HR (9.368 G/ HP HR)

SFC = .967 KG/ KW HR (.708 G/ HP HR)

TABLE C-4. MASS EMISSIONS BY NINE-MODE FTP -METRIC UNITS

ENGINE-20 TEST-2001 RUN-3 BASELINE AFTER OVERHAUL(0-12-22 K = .473 HUM = 9.6 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	COP	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NO2	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NO2-CL	KW	HP
1 IDLE	9222	.280	12.02	53	12.228	1882	63	89	3	.232	14.7	19	.6	0	0
2 16 MG	325	.310	13.59	930	13.933	8960	20	380	87	.077	1.5	29	6.7	13	18
3 10 MG	607	.310	13.97	1632	14.391	13100	55	572	496	.197	8.1	89	73.0	37	99
4 16 MG	299	.320	13.71	970	14.059	8960	15	389	94	.077	1.1	30	7.2	13	18
5 19 MG	81	.050	12.73	130	12.788	5715	4	95	19	.057	.2	3	1.1	0	0
6 16 MG	262	.380	13.59	990	13.996	8960	16	969	98	.077	1.2	36	7.6	13	18
7 3 MG	651	.320	13.71	2109	14.195	18257	89	965	902	.113	9.5	109	101.9	61	81
8 16 MG	208	.290	13.89	560	14.151	8960	12	350	111	.077	1.0	27	8.6	13	18
9 C.T.	22229	.310	9.59	32	12.128	1882	396	97	2	.193	99.9	19	.2	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											5.3	21	12.6		
1 IDLE	2696	.340	12.97	63	12.965	1882	38	97	3	.232	8.9	22	.7	0	0
2 16 MG	349	.310	13.59	930	13.933	8960	20	380	95	.077	1.6	29	7.3	13	18
3 10 MG	616	.330	13.97	1680	14.362	13100	56	608	509	.197	8.3	89	74.8	37	99
4 16 MG	253	.320	13.59	910	13.935	8960	15	392	103	.077	1.2	30	7.9	13	18
5 19 MG	179	.060	12.85	190	12.928	5715	8	59	21	.057	.5	3	1.2	0	0
6 16 MG	299	.320	13.59	900	13.939	8960	15	392	101	.077	1.1	30	7.8	13	18
7 3 MG	633	.290	13.89	2195	14.193	18257	81	759	937	.113	9.2	85	105.9	61	81
8 16 MG	208	.310	13.89	550	14.171	8960	12	379	109	.077	1.0	29	8.4	13	18
9 C.T.	20992	.320	9.88	33	12.215	1882	323	100	2	.193	96.2	19	.2	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											4.7	20	13.1		
1 IDLE	3699	.320	12.25	63	12.939	1882	53	99	3	.232	12.3	22	.7	0	0
2 16 MG	325	.310	13.59	960	13.933	8960	20	380	93	.077	1.5	29	7.1	13	18
3 10 MG	625	.370	13.97	1659	14.403	13100	57	690	501	.197	8.9	100	73.6	37	99
4 16 MG	299	.330	13.59	910	13.999	8960	15	909	103	.077	1.1	31	7.9	13	18
5 19 MG	179	.060	12.73	190	12.808	5715	8	59	21	.057	.5	3	1.2	0	0
6 16 MG	224	.320	13.59	990	13.933	8960	19	393	99	.077	1.1	30	7.6	13	18
7 3 MG	633	.270	13.89	2195	14.173	18257	82	703	939	.113	9.2	79	106.1	61	81
8 16 MG	224	.340	13.59	570	13.953	8960	19	916	115	.077	1.1	32	8.8	13	18
9 C.T.	21290	.320	9.80	35	12.299	1882	327	99	2	.193	96.8	19	.3	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											5.0	21	13.0		
1 IDLE	2663	.320	12.99	70	13.096	1882	91	93	3	.232	9.5	22	.8	0	0
2 16 MG	316	.320	13.59	990	13.992	8960	19	952	98	.077	1.5	35	7.6	13	18
3 10 MG	580	.330	13.97	1672	14.358	13100	53	608	976	.197	7.8	89	70.4	37	99
4 16 MG	262	.340	13.59	500	13.954	8960	16	916	101	.077	1.2	32	7.7	13	18
5 19 MG	219	.050	12.41	125	12.681	5715	10	96	19	.057	.6	3	1.1	0	0
6 16 MG	235	.310	13.59	520	13.923	8960	19	380	105	.077	1.1	29	8.1	13	18
7 3 MG	651	.320	13.71	2186	14.095	18257	89	837	990	.113	9.5	95	106.2	61	81
8 16 MG	190	.310	13.89	555	14.149	8960	11	379	110	.077	.9	29	8.5	13	18
9 C.T.	20602	.310	9.80	37	12.170	1882	319	92	2	.193	95.6	19	.3	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											4.7	21	12.8		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)----------											5.0	21	12.8		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)----------											4.4	21	12.9		

FOUR CYCLE COMPOSITE =

HC= FID 0.35(5.0) + 0.65(4.4) = 4.622 G/ KW HR (3.471 G/ HP HR)

CO= NDIR 0.35(20.9) + 0.65(21.0) = 20.953 G/ KW HR (15.625 G/ HP HR)

NO2-CL 0.35(12.8) + 0.65(12.9) = 12.900 G/ KW HR (9.619 G/ HP HR)

CORRECTED NO2 = 12.552 G/ KW HR (9.360 G/ HP HR)

BFC = .965 KG/ KW HR (.705 G/ HP HR)

TABLE C-5 MASS EMISSIONS BY NINE-MODE FTP -METRIC UNITS

ENGINE-20 TEST-2884 RUN-2 EMISSIONS CONT. SYS. 11-22-77 K = .938 HUM = 8.3 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NO2	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NO2-CL	KW	HP
1 IDLE	956	.112	9.19	36	9,317	1950	7	67	3	.232	1.7	11	.6	0	0
2 16 MG	695	.205	10.55	88	10,810	6577	33	253	18	.077	2.6	19	1.9	7	9
3 10 MG	99	.231	12.25	450	12,990	10841	8	909	130	.147	1.2	59	19.1	28	38
4 16 MG	190	.187	10.88	105	11,086	6577	11	229	21	.077	.9	17	1.6	7	9
5 19 MG	648	.237	10.99	35	10,769	9763	30	212	5	.057	1.7	12	.3	0	0
6 16 MG	203	.190	10.88	101	11,090	6577	12	228	20	.077	.9	18	1.5	7	9
7 3 MG	18	.319	19.98	525	19,801	17896	2	799	811	.113	.2	88	23.8	55	73
8 16 MG	39	.112	11.10	116	11,215	6577	2	132	22	.077	.2	10	1.7	7	9
9 C.T.	9979	.019	.19	6	.556	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											.8	19	9.0		
1 IDLE	694	.112	8.97	36	9,151	1950	15	48	2	.232	3.4	11	.6	0	0
2 16 MG	703	.205	10.99	94	10,716	6577	93	255	19	.077	3.3	20	1.8	7	9
3 10 MG	98	.250	12.26	990	12,510	10841	9	937	127	.147	1.3	69	18.6	28	38
4 16 MG	207	.187	10.88	115	11,088	6577	12	229	23	.077	.9	17	1.7	7	9
5 19 MG	979	.237	10.55	40	10,829	9763	16	211	6	.057	.9	12	.3	0	0
6 16 MG	57	.190	10.88	100	11,076	6577	3	228	20	.077	.3	18	1.5	7	9
7 3 MG	86	.322	19.36	526	19,681	17896	11	799	812	.113	1.2	90	24.0	55	73
8 16 MG	55	.109	11.21	130	11,329	6577	3	188	85	.077	.2	10	1.9	7	9
9 C.T.	9166	.019	.19	5	.575	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											.9	19	9.0		
1 IDLE	1091	.106	8.97	37	9,180	1950	22	96	3	.232	5.1	11	.6	0	0
2 16 MG	921	.212	10.99	88	10,729	6577	44	262	18	.077	3.4	20	1.9	7	9
3 10 MG	107	.276	12.25	980	12,536	10841	9	981	138	.147	1.9	71	20.3	28	38
4 16 MG	238	.193	10.88	120	11,099	6577	14	231	24	.077	1.1	18	1.8	7	9
5 19 MG	528	.229	10.66	40	10,937	9763	23	197	6	.057	1.3	11	.3	0	0
6 16 MG	220	.188	10.77	105	10,936	6577	13	223	21	.077	1.0	17	1.6	7	9
7 3 MG	31	.392	19.48	510	19,896	17896	4	953	804	.113	.4	106	23.0	55	73
8 16 MG	110	.106	11.10	120	11,217	6577	6	126	23	.077	.6	10	1.8	7	9
9 C.T.	9230	.021	.19	6	.589	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											1.1	21	9.1		
1 IDLE	839	.098	8.97	37	9,351	1950	17	91	3	.232	4.0	10	.6	0	0
2 16 MG	878	.210	10.33	82	10,636	6577	54	272	17	.077	3.2	21	1.3	7	9
3 10 MG	107	.263	12.37	985	12,643	10841	9	955	138	.147	1.9	67	20.3	28	38
4 16 MG	216	.187	10.88	115	11,089	6577	13	229	23	.077	1.0	17	1.7	7	9
5 19 MG	640	.229	10.66	38	10,928	9763	19	197	5	.057	1.1	11	.3	0	0
6 16 MG	211	.187	10.77	102	10,978	6577	13	227	20	.077	1.0	17	1.6	7	9
7 3 MG	31	.350	19.48	520	19,833	17896	4	953	806	.113	.4	96	23.6	55	73
8 16 MG	64	.098	11.10	120	11,209	6577	4	116	23	.077	.3	9	1.8	7	9
9 C.T.	9168	.021	.18	6	.620	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											1.1	20	9.1		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)----------											.8	19	9.0		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 9)----------											1.1	21	9.1		

FOUR CYCLE COMPOSITE =

HC= FID 0.35(.8) + 0.65(1.1) = 1.016 G/ KW HR (.757 GR)

CO= NDIR 0.35(19.2) + 0.65(20.7) = 20.144 G/ KW HR (15.021 GR)

NO2-CL 0.35(9.0) + 0.65(9.1) = 9.077 G/ KW HR (3.040 GR)

CORRECTED NO2 = 3.824 G/ KW HR (2.852 GR)

SFC = .512 KG/ KW HR (.842 GR)

TABLE C-6. MASS EMISSIONS BY NINE-MODE FTP -METRIC UNITS

ENGINE-20 TEST-2009 RUN-1 EMISSION CONT. SYS. 11-22-77 K = .907 HUM = 7.2 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NO2	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NO2-CL	KW	HP
1 IDLE	650	.120	8.97	35	9,155	1819	13	98	2	.232	3.0	11	.5	0	0
2 16 MG	432	.205	10.44	85	10,699	6509	32	253	17	.077	2.5	19	1.3	4	6
3 10 MG	81	.299	12.25	995	12,992	10773	9	987	127	.147	1.8	60	18.7	28	38
4 16 MG	183	.184	10.77	120	10,932	6509	11	221	24	.077	.8	17	1.8	4	6
5 19 MG	457	.217	10.44	90	10,723	9672	20	209	6	.057	1.1	12	.3	0	0
6 16 MG	99	.184	10.77	105	10,969	6509	6	221	21	.077	.5	17	1.6	4	6
7 3 MG	18	.302	19.78	560	19,039	17872	2	736	221	.113	.2	82	25.0	56	75
8 16 MG	38	.109	11.10	120	11,212	6509	2	128	23	.077	.1	10	1.8	4	6
9 C.T.	3197	.014	.14	6	.494	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KM HR----------											.8	18	4.1		
1 IDLE	328	.109	8.97	35	9,152	1819	14	99	2	.232	3.3	10	.5	0	0
2 16 MG	695	.209	10.44	86	10,719	6509	42	256	17	.077	3.2	20	1.3	4	6
3 10 MG	62	.276	12.26	990	12,532	10773	6	939	140	.147	.8	70	20.6	28	38
4 16 MG	229	.193	10.77	115	10,986	6509	14	231	23	.077	1.0	18	1.7	4	6
5 19 MG	616	.293	10.46	94	10,965	9672	26	209	6	.057	1.5	12	.3	0	0
6 16 MG	229	.193	10.77	115	10,986	6509	14	231	23	.077	1.0	18	1.7	4	6
7 3 MG	26	.302	19.98	560	19,785	17872	3	738	225	.113	.4	83	25.4	56	75
8 16 MG	36	.196	11.10	125	11,210	6509	2	129	24	.077	.2	10	1.9	4	6
9 C.T.	3489	.019	.14	6	.518	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KM HR----------											.9	19	4.3		
1 IDLE	816	.101	9.03	34	9,252	1819	16	98	2	.232	3.7	9	.5	0	0
2 16 MG	843	.205	10.33	90	10,628	6509	52	254	18	.077	4.0	20	1.4	4	6
3 10 MG	116	.282	12.37	990	12,664	10773	10	985	129	.147	1.5	71	18.3	28	38
4 16 MG	227	.187	10.77	120	10,980	6509	13	224	24	.077	1.0	17	1.8	4	6
5 19 MG	542	.291	10.66	98	10,915	9672	18	199	6	.057	.6	11	.3	0	0
6 16 MG	242	.193	10.77	115	10,988	6509	14	231	23	.077	1.1	18	1.7	4	6
7 3 MG	34	.350	19.73	555	19,083	17872	4	833	218	.113	.5	95	24.7	56	75
8 16 MG	44	.186	11.18	135	11,211	6509	3	184	26	.077	.2	10	2.0	4	6
9 C.T.	3496	.023	.14	6	.548	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KM HR----------											1.0	20	4.1		
1 IDLE	982	.095	9.19	37	9,293	1819	15	37	2	.232	3.5	9	.6	0	0
2 16 MG	939	.196	10.33	95	10,680	6509	45	243	19	.077	3.5	19	1.5	4	6
3 10 MG	121	.282	12.37	980	12,664	10773	10	985	136	.147	1.5	71	19.9	28	38
4 16 MG	220	.187	10.77	125	10,979	6509	13	224	25	.077	1.0	17	1.9	4	6
5 19 MG	396	.293	10.66	98	10,943	9672	19	210	6	.057	1.0	12	.3	0	0
6 16 MG	220	.184	10.77	110	10,976	6509	13	221	22	.077	1.0	17	1.7	4	6
7 3 MG	35	.316	19.98	560	19,799	17872	4	770	225	.113	.5	87	25.4	56	75
8 16 MG	50	.112	11.10	130	11,217	6509	3	131	25	.077	.2	10	1.9	4	6
9 C.T.	3467	.023	.18	15	.588	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KM HR----------											1.0	20	4.3		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)----------											.8	19	4.2		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)----------											1.0	20	4.2		

FOUR CYCLE COMPOSITE -

HC= FID 0.35(.8) + 0.65(1.0) = .993 G/ KW HR (.703 BS)

CO= NDIR 0.35(18.9) + 0.65(19.9) = 19.543 G/ KW HR (14.573 BS)

NO2-CL 0.35(4.2) + 0.65(4.2) = 4.203 G/ KW HR (3.134 BS)

CORRECTED NO2 = 3.813 G/ KW HR (2.843 BS)

SFC = .508 KG/ KW HR (.835 BS)

TABLE C-7. MASS EMISSIONS BY NINE-MODE FTP -METRIC UNITS

ENGINE-20 TEST-2005 RUN-1 EMIS. CONT. SYS. H CAT. 11-22-77 K = .989 HUM = 10.2 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NO2	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NO2-CL	KW	HP
1 IDLE	1	.012	9.69	39	9.702	1837	0	4	2	.232	.0	1	.6	0	0
2 16 MG	38	.012	10.11	51	10.125	6124	2	14	10	.077	.2	1	.8	4	5
3 10 MG	1	.012	12.14	248	12.152	10342	0	20	70	.147	.0	3	10.3	26	35
4 16 MG	5	.012	10.55	69	10.562	6124	0	14	13	.077	.0	1	1.0	4	5
5 19 MG	29	.009	8.00	22	8.012	4899	2	11	4	.057	.1	1	.3	0	0
6 16 MG	2	.009	10.44	65	10.449	6124	0	11	13	.077	.0	1	1.0	4	5
7 3 MG	1	.009	14.48	620	14.489	17826	0	23	253	.113	.0	3	28.6	54	72
8 16 MG	4	.009	10.88	85	10.890	6124	0	10	16	.077	.0	1	1.2	4	5
9 C.T.	10	.009	.64	8	.650	0	0	0	0	.143	0.0	0	0.0	0	0
-CYCLE COMPOSITE IN G / KW HR-											.0	1	3.9		
1 IDLE	11	.009	9.69	42	9.700	1837	0	4	3	.232	.0	1	.6	0	0
2 16 MG	83	.009	10.44	60	10.458	6124	5	11	12	.077	.4	1	.9	4	5
3 10 MG	10	.009	12.37	312	12.380	10342	1	16	87	.147	.1	2	12.7	26	35
4 16 MG	25	.007	10.77	80	10.779	6124	1	8	16	.077	.1	1	1.2	4	5
5 19 MG	107	.007	7.81	25	7.828	4899	7	9	5	.057	.4	0	.3	0	0
6 16 MG	23	.007	10.66	70	10.669	6124	1	8	13	.077	.1	1	1.0	4	5
7 3 MG	1	.007	14.35	585	14.357	17826	0	17	241	.113	.0	2	27.2	54	72
8 16 MG	3	.007	10.99	84	10.997	6124	0	8	16	.077	.0	1	1.2	4	5
9 C.T.	9	.005	.72	10	.726	0	0	0	0	.143	0.0	0	0.0	0	0
-CYCLE COMPOSITE IN G / KW HR-											.1	1	4.1		
1 IDLE	13	.007	9.69	43	9.698	1837	0	3	3	.232	.1	1	.6	0	0
2 16 MG	84	.007	10.44	63	10.455	6124	5	8	12	.077	.4	1	.9	4	5
3 10 MG	12	.007	12.49	325	12.498	10342	1	12	89	.147	.1	2	13.1	26	35
4 16 MG	28	.005	10.88	85	10.887	6124	2	5	16	.077	.1	0	1.2	4	5
5 19 MG	213	.007	7.08	25	7.108	4899	15	10	6	.057	.8	1	.3	0	0
6 16 MG	25	.007	10.66	75	10.669	6124	1	8	14	.077	.1	1	1.1	4	5
7 3 MG	1	.005	14.60	520	14.605	17826	0	11	211	.113	.0	1	23.8	54	72
8 16 MG	1	.005	10.99	96	10.995	6124	0	5	18	.077	.0	0	1.4	4	5
9 C.T.	5	.005	.76	9	.765	0	0	0	0	.143	0.0	0	0.0	0	0
-CYCLE COMPOSITE IN G / KW HR-											.2	1	3.8		
1 IDLE	9	.005	9.59	44	9.595	1837	0	2	3	.232	.0	0	.6	0	0
2 16 MG	81	.005	10.55	625	10.563	6124	5	5	120	.077	.4	0	9.3	4	5
3 10 MG	11	.005	12.49	335	12.496	10342	1	8	92	.147	.1	1	13.5	26	35
4 16 MG	31	.005	10.77	85	10.778	6124	2	5	16	.077	.1	0	1.2	4	5
5 19 MG	107	.005	7.35	25	7.365	4899	7	6	6	.057	.4	0	.3	0	0
6 16 MG	26	.005	10.66	75	10.667	6124	2	5	14	.077	.1	0	1.1	4	5
7 3 MG	1	.005	14.48	540	14.485	17826	0	11	221	.113	.0	1	24.9	54	72
8 16 MG	1	.005	10.99	91	10.995	6124	0	5	17	.077	.0	0	1.3	4	5
9 C.T.	5	.005	.80	10	.805	0	0	0	0	.143	0.0	0	0.0	0	0
-CYCLE COMPOSITE IN G / KW HR-											.1	0	4.7		
AVERAGE SUM--(COMPOSITE VALUES FOR CYCLES 1 AND 2)-											.1	1	4.0		
AVERAGE SUM--(COMPOSITE VALUES FOR CYCLES 3 AND 4)-											.1	0	4.3		

FOUR CYCLE COMPOSITE =

HC= FID 0.35(.1) + 0.65(.1) = .109 G/ KW HR (.081 BS)

CO= NDIR 0.35(.9) + 0.65(.5) = .625 G/ KW HR (.466 BS)

NO2-CL 0.35(4.0) + 0.65(4.3) = 4.184 G/ KW HR (3.120 BS)

CORRECTED NO2 = 4.137 G/ KW HR (3.085 BS)

SFC = .553 KG/ KW HR (.909 BS)

TABLE C-8. MASS EMISSIONS BY NINE-MODE FTP -METRIC UNITS

ENGINE-20 TEST-2005 RUN-2 EMIS. CONT. SYS. W CAT. 11-22-77 K =1.013 HUM = 11.2 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NO2	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NO2-CL	KW	HP
1 IDLE	29	.005	9.59	35	9,597	1678	0	2	2	.232	.1	0	.5	0	0
2 16 MG	199	.005	10.01	99	10,029	6078	9	6	9	.077	.7	0	.7	3	5
3 10 MG	12	.005	12.19	250	12,196	10342	1	8	71	.147	.2	1	10.4	26	35
4 16 MG	36	.005	10.55	75	10,558	6078	2	5	14	.077	.2	0	1.1	3	5
5 19 MG	163	.005	7.72	20	7,741	4944	10	6	4	.057	.6	0	.2	0	0
6 16 MG	33	.005	10.44	60	10,448	6078	2	5	12	.077	.1	0	.9	3	5
7 3 MG	0	.005	14.35	580	14,355	17690	0	11	237	.113	0.0	1	26.8	53	72
8 16 MG	5	.005	10.77	85	10,775	6078	0	5	16	.077	.0	0	1.2	3	5
9 C.T.	5	.002	.72	6	.723	0	0	0	0	.193	0.0	0	0.0	0	0
											.2	0	3.8		
1 IDLE	17	.002	9.80	39	9,804	1678	0	1	2	.232	.1	0	.5	0	0
2 16 MG	119	.002	10.22	55	10,234	6078	7	3	11	.077	.5	0	.8	3	5
3 10 MG	16	.002	12.37	280	12,374	10342	1	4	78	.147	.2	1	11.4	26	35
4 16 MG	38	.002	10.66	80	10,666	6078	2	3	15	.077	.2	0	1.2	3	5
5 19 MG	56	.002	7.81	50	7,818	4944	4	3	10	.057	.2	0	.6	0	0
6 16 MG	42	.002	10.55	70	10,556	6078	2	3	13	.077	.2	0	1.0	3	5
7 3 MG	1	.002	14.48	530	14,482	17690	0	6	215	.113	.0	1	24.3	53	72
8 16 MG	3	.002	10.88	9	10,883	6078	0	3	2	.077	.0	0	.1	3	5
9 C.T.	5	.002	.72	6	.723	0	0	0	0	.193	0.0	0	0.0	0	0
											.1	0	3.7		
1 IDLE	13	.002	9.90	41	9,904	1678	0	1	2	.232	.1	0	.5	0	0
2 16 MG	93	.002	10.44	63	10,452	6078	5	3	12	.077	.4	0	.9	3	5
3 10 MG	13	.002	12.49	310	12,499	10342	1	4	86	.147	.2	1	12.5	26	35
4 16 MG	32	.002	10.66	80	10,665	6078	2	3	15	.077	.1	0	1.2	3	5
5 19 MG	49	.002	6.22	40	6,227	4944	4	4	11	.057	.2	0	.6	0	0
6 16 MG	43	.002	10.55	70	10,557	6078	2	3	13	.077	.2	0	1.0	3	5
7 3 MG	1	.002	14.60	495	14,602	17690	0	6	199	.113	.0	1	22.5	53	72
8 16 MG	3	.002	10.88	85	10,883	6078	0	3	16	.077	.0	0	1.2	3	5
9 C.T.	5	.002	.80	8	.803	0	0	0	0	.193	0.0	0	0.0	0	0
											.1	0	3.7		
1 IDLE	11	.002	9.90	41	9,903	1678	0	1	2	.232	.0	0	.5	0	0
2 16 MG	99	.002	10.44	54	10,452	6078	6	3	10	.077	.4	0	.8	3	5
3 10 MG	15	.002	12.49	310	12,499	10342	1	4	85	.147	.2	1	12.5	26	35
4 16 MG	40	.002	10.77	80	10,776	6078	2	3	15	.077	.2	0	1.2	3	5
5 19 MG	43	.002	7.25	50	7,257	4944	3	3	11	.057	.2	0	.6	0	0
6 16 MG	40	.002	10.66	70	10,666	6078	2	3	13	.077	.2	0	1.0	3	5
7 3 MG	0	.002	14.60	480	14,602	17690	0	6	193	.113	0.0	1	21.8	53	72
8 16 MG	3	.002	10.88	90	10,883	6078	0	3	17	.077	.0	0	1.3	3	5
9 C.T.	4	.002	.76	10	.763	0	0	0	0	.193	0.0	0	0.0	0	0
											.1	0	3.6		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)----------											.1	0	3.7		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)----------											.1	0	3.7		

FOUR CYCLE COMPOSITE =

HC- FID 0.35(.1) + 0.65(.1) = .123 G/ KW HR (.092 BS)

CO- NDIR 0.35(.3) + 0.65(.2) = .258 G/ KW HR (.193 BS)

NO2-CL 0.35(3.7) + 0.65(3.7) = 3.698 G/ KW HR (2.758 BS)

CORRECTED NO2 = 3.745 G/ KW HR (2.792 BS)

SFC = .555 KG/ KW HR (.912 BS)

TABLE C-9. MASS EMISSIONS BY NINE-MODE EPA - METRIC UNITS

1975 CHEVROLET 350-CID HD ENGINE---PROJECT 11-4311

ENGINE-20 TEST-2002 RUN-1 10-18-77 BASELINE AFTER OVERHAUL K= 1.027 HUM= 12.0 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NOX-CL	CKW	VAC. MM
1 IDLE	3520	.355	12.41	61	13.359	1860	55	100	3	.232	12.7	23	.7	0.0	422
2 25 PCT T	336	.199	13.59	685	13.822	9662	26	274	143	.077	2.0	21	12.6	17.8	366
3 55 PCT T	669	.281	14.09	1747	14.496	14016	73	551	594	.147	10.7	81	87.9	40.2	236
4 25 PCT T	228	.200	13.71	450	13.935	9163	17	265	196	.077	1.3	20	11.2	17.3	378
5 10 PCT T	176	.269	13.59	340	13.879	7399	11	289	62	.057	.6	16	3.5	8.0	437
6 25 PCT T	229	.217	13.71	625	13.952	9026	17	283	138	.077	1.3	22	10.6	17.2	378
7 90 PCT T	872	.789	13.84	2239	14.728	19096	128	2066	990	.113	14.5	233	111.8	64.6	66
8 25 PCT T	184	.290	13.71	605	13.970	8800	13	305	130	.077	1.0	23	10.0	16.7	391
9 C.T.	25277	.269	9.90	26	12.934	1860	399	78	1	.143	56.9	11	.2	0.0	612
1 IDLE	3136	.330	12.73	81	13.911	1905	50	95	4	.232	11.6	22	.9	0.0	414
2 25 PCT T	324	.228	13.59	640	13.855	9117	24	303	144	.077	1.9	23	11.1	17.2	378
3 55 PCT T	632	.305	14.09	1765	14.467	13789	68	588	573	.147	10.0	86	84.3	40.3	234
4 25 PCT T	228	.239	13.71	635	13.970	8936	16	302	138	.077	1.3	23	10.7	16.6	384
5 10 PCT T	180	.234	13.59	345	13.844	7530	11	257	68	.057	.6	15	3.9	8.0	432
6 25 PCT T	238	.228	13.71	675	13.965	9163	18	302	151	.077	1.9	23	11.6	17.2	378
7 90 PCT T	965	.986	13.84	2270	14.936	19006	140	2534	985	.113	15.8	286	111.3	64.6	66
8 25 PCT T	180	.222	13.84	654	14.083	8981	13	286	142	.077	1.0	22	10.9	16.7	386
9 C.T.	21038	.234	10.11	29	12.649	1769	322	66	1	.143	46.1	9	.2	0.0	612

MODE	ID	----UNITS AS SPECIFIED IN THE 7-11-75 PROCEDURE---- MV	CHP	CTQ	FC	SFC BSFC	BSNOX	F/A	KG/KW HR	RPM	CALC A/F	---------PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1 I		16.6	0.0	0	4.1	R	R	.061	R	580	16.5	12.6	5.1	.3	5.3	0.0
2 25		14.4	23.8	63	21.3	.893	6.9	.062	.543	2000	16.1	2.0	4.7	5.1	9.1	7.2
3 55		9.3	53.9	142	30.9	.573	11.1	.045	.349	2000	15.4	10.6	17.9	35.2	25.3	31.1
4 25		14.9	23.1	61	20.2	.873	6.4	.063	.531	2000	15.9	1.3	4.5	4.5	8.6	7.0
5 10		17.2	10.8	28	16.3	1.515	5.8	.063	.922	1990	16.0	.6	3.7	1.4	5.2	2.4
6 25		14.9	23.1	61	19.9	.860	6.0	.063	.523	1995	15.9	1.3	4.8	4.3	8.5	7.0
7 90		2.6	86.7	227	42.1	.486	11.6	.066	.295	2005	15.0	14.4	51.6	45.1	26.4	38.5
8 25		15.4	22.3	59	19.4	.869	5.9	.063	.528	1995	15.9	1.0	5.2	4.0	8.3	6.8
9 CT		24.1	0.0	0	4.1	R	R	.061	R	1995	16.4	56.3	2.5	.1	3.3	0.0
1 I		16.3	0.0	0	4.2	R	R	.061	R	580	16.4	12.9	4.3	.4	5.5	0.0
2 25		14.9	23.1	61	20.1	.871	6.3	.062	.530	1995	16.0	2.1	4.6	4.5	8.7	7.0
3 55		9.2	54.0	142	30.4	.563	10.8	.065	.342	2000	15.4	11.2	16.9	34.4	25.1	31.3
4 25		15.1	22.3	59	19.7	.883	6.3	.063	.537	1995	15.9	1.4	4.6	4.4	8.5	6.8
5 10		17.0	10.8	28	16.6	1.540	6.4	.062	.936	1995	16.0	.7	2.9	1.6	5.3	2.4
6 25		14.9	23.1	61	20.2	.873	6.6	.063	.531	1995	15.9	1.5	4.6	4.7	8.7	7.0
7 90		2.6	86.7	227	41.9	.583	11.5	.067	.299	2005	14.8	17.6	56.1	45.4	26.6	38.6
8 25		15.2	22.4	59	19.8	.885	6.5	.063	.538	1995	15.8	1.1	4.3	4.5	8.6	6.8
9 CT		24.1	0.0	0	3.9	R	R	.059	R	2000	16.9	51.9	1.8	.1	3.1	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 5.4 24 13.2

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 4.8 27 13.1

TWO CYCLE COMPOSITE - HC- FID 0.35(5.4) + 0.65(4.8) = 5.010 G/KW HR (3.736 BS)

CO- NDIR 0.35(24.1) + 0.65(27.4) = 26.241 G/KW HR (19.568 BS)

NOX-CL 0.35(13.2) + 0.65(13.1) = 13.163 G/KW HR (9.816 BS)

HC + NOX = 18.173 G/KW HR (13.552 BS)

SFC = .429 KG/KW HR (.704 BS)

ID =

TABLE C-10. MASS EMISSIONS BY NINE-MODE EPA - METRIC UNITS

1975 CHEVROLET 350-CID HD ENGINE---PROJECT 11-4311

ENGINE-20 TEST-2002 RUN-2 10-18-77 BASELINE AFTER OVERHAUL K= 1.010 HUM= 11.2 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NOX-CL	CKW	VAC. MM
1 IDLE	4640	.305	12.14	62	12.963	1769	71	84	3	.232	16.4	20	.7	0.0	417
2 25 PCT T	354	.251	13.59	680	13.881	9525	27	348	156	.077	2.1	27	12.0	17.7	371
3 55 PCT T	700	.342	14.09	1797	14.512	13698	75	653	569	.147	11.0	96	83.6	39.6	241
4 25 PCT T	243	.245	13.71	685	13.983	9117	18	323	150	.077	1.4	25	11.5	17.2	378
5 10 PCT T	196	.240	13.59	375	13.852	7394	12	258	67	.057	.7	15	3.8	8.6	434
6 25 PCT T	252	.245	13.59	720	13.864	9344	19	334	163	.077	1.5	26	12.5	18.4	371
7 90 PCT T	1072	1.076	13.84	2392	15.038	19278	154	2787	1028	.113	17.7	315	116.2	65.2	66
8 25 PCT T	176	.263	13.71	700	13.993	8890	13	338	149	.077	1.0	26	11.5	17.2	381
9 C.T.	26690	.281	9.69	32	12.886	1905	431	84	2	.143	61.6	12	.2	0.0	612
1 IDLE	3072	.406	12.49	80	13.240	1905	49	118	4	.232	11.5	27	.9	0.0	429
2 25 PCT T	332	.275	13.59	725	13.902	9344	25	373	163	.077	1.9	29	12.6	17.3	371
3 55 PCT T	669	.349	13.97	1869	14.394	13608	72	666	592	.147	10.5	98	87.1	39.4	244
4 25 PCT T	232	.269	13.71	700	14.005	8981	17	348	150	.077	1.3	27	11.6	16.7	378
5 10 PCT T	176	.240	13.47	350	13.729	7257	10	256	62	.057	.6	15	3.5	6.9	439
6 25 PCT T	236	.234	13.59	740	13.850	9253	18	316	166	.077	1.4	24	12.8	17.3	378
7 90 PCT T	1032	.849	13.97	2511	14.936	19232	151	2207	1084	.113	17.1	249	122.5	65.7	66
8 25 PCT T	192	.275	13.71	705	14.007	8890	14	353	150	.077	1.1	27	11.6	16.8	381
9 C.T.	24806	.275	9.90	35	12.889	1905	401	82	2	.143	57.4	12	.2	0.0	612

MODE	ID	----UNITS AS SPECIFIED IN THE 7-11-75 PROCEDURE---- HV	CHP	CTQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	---------PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1	I	16.9	0.0	0	3.9	R	R	.059	R	560	16.9	14.5	3.5	.3	5.0	0.0
2	25	19.6	23.8	63	21.0	.883	6.7	.063	.537	1990	16.0	1.9	4.8	4.8	9.0	7.1
3	55	9.5	53.1	140	30.2	.569	10.8	.065	.396	1995	15.3	9.7	17.1	33.2	29.8	30.5
4	25	19.9	23.1	61	20.1	.871	6.6	.063	.530	1990	15.9	1.2	4.4	4.6	8.6	6.9
5	10	17.1	11.5	30	16.3	1.412	5.9	.062	.859	1990	16.0	.6	2.6	1.5	5.2	2.6
6	25	19.6	24.6	65	20.6	.837	6.7	.062	.509	1990	16.0	1.3	4.6	5.0	8.8	7.4
7	90	2.6	87.5	230	92.5	.486	11.9	.068	.296	2000	14.7	15.6	56.2	46.1	24.8	38.6
8	25	15.0	23.1	61	19.6	.848	6.6	.063	.516	1990	15.9	.9	4.6	4.6	8.4	6.9
9	CT	29.1	0.0	0	9.2	R	R	.061	R	1990	16.5	59.9	2.1	.1	3.3	0.0
1	I	16.9	0.0	0	9.2	R	R	.060	R	590	16.6	11.2	5.4	.3	5.4	0.0
2	25	19.6	23.2	61	20.6	.887	7.1	.063	.590	2000	16.0	1.9	5.7	4.8	8.9	7.1
3	55	9.6	52.8	138	30.0	.568	11.4	.065	.396	2005	15.9	10.2	19.3	33.1	29.7	30.7
4	25	19.9	22.4	59	19.8	.882	6.8	.063	.536	2000	15.9	1.3	5.3	4.4	8.5	6.8
5	10	17.3	9.3	24	16.0	1.722	6.8	.062	1.048	2000	16.2	.6	2.9	1.3	5.1	2.1
6	25	19.9	23.2	61	20.9	.879	7.3	.062	.535	2000	16.0	1.3	4.8	4.9	8.8	7.1
7	90	2.6	88.1	230	92.9	.481	12.5	.067	.293	2015	14.8	16.6	99.1	46.6	26.8	39.9
8	25	15.0	22.5	59	19.6	.871	6.8	.063	.530	2005	15.9	1.0	5.3	4.4	8.4	6.9
9	CT	29.1	0.0	0	9.2	R	R	.061	R	2005	16.5	55.9	2.3	.1	3.4	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 6.0 30 13.4

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 5.5 27 14.2

TWO CYCLE COMPOSITE -

HC- FID 0.35(6.0) + 0.65(5.5) = 5.704 G/KW HR (4.253 BS)

CO- NDIR 0.35(29.8) + 0.65(27.4) = 28.218 G/KW HR (21.043 BS)

NOX-CL 0.35(13.4) + 0.65(14.2) = 13.891 G/KW HR (10.358 BS)

HC + NOX = 19.595 G/KW HR (14.612 BS)

SFC = .429 KG/KW HR (.705 BS)

ID =

TABLE C-11. MASS EMISSIONS BY NINE-MODE EPA - METRIC UNITS

1975 CHEVROLET 350-CID HD ENGINE---PROJECT 11-9311

ENGINE=20 TEST=2002 RUN=3 10-19-77 BASELINE AFTER OVERHAUL K= 1.015 HUM= 11.9 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NOX-CL	CKW	VAC. MM
1 IDLE	2880	.380	12.61	69	13.313	1950	92	113	3	.232	11.0	26	.7	0.0	919
2 25 PCT T	356	.275	13.59	635	13.905	9571	28	382	197	.077	2.1	29	11.3	17.2	368
3 55 PCT T	732	.393	14.09	1470	14.566	14061	80	767	593	.147	11.8	113	79.8	40.4	239
4 25 PCT T	244	.269	13.71	620	14.007	9480	19	368	191	.077	1.4	28	10.9	17.9	371
5 10 PCT T	160	.217	13.47	305	13.705	7439	16	237	56	.057	.6	14	3.2	8.0	437
6 25 PCT T	246	.281	13.59	645	13.899	9525	19	389	199	.077	1.5	30	11.5	17.9	371
7 90 PCT T	1136	1.374	13.71	2105	15.214	19323	164	3525	901	.113	18.6	398	101.8	65.3	63
8 25 PCT T	212	.305	13.71	663	14.039	9117	16	400	195	.077	1.2	31	11.2	17.9	376
9 C.T.	25277	.330	9.90	31	12.997	1950	915	100	2	.143	59.9	14	.2	0.0	612
1 IDLE	2880	.366	12.73	85	13.520	1996	98	139	4	.232	11.1	32	1.0	0.0	917
2 25 PCT T	342	.287	13.59	665	13.916	9525	26	397	153	.077	2.0	31	11.8	17.3	368
3 55 PCT T	692	.311	13.97	1680	14.360	13835	75	606	595	.147	11.1	89	80.2	39.9	236
4 25 PCT T	248	.269	13.71	960	14.007	9349	19	362	103	.077	1.4	28	8.0	17.9	371
5 10 PCT T	176	.263	13.34	310	13.623	7212	10	281	55	.057	.6	16	3.2	6.9	442
6 25 PCT T	244	.299	13.71	645	14.037	9349	19	402	195	.077	1.4	31	11.1	17.3	371
7 90 PCT T	1216	1.569	13.59	2197	15.298	19691	178	4070	929	.113	20.1	960	105.0	66.5	61
8 25 PCT T	198	.251	13.59	665	13.863	9072	19	432	197	.077	1.1	26	11.3	17.3	376
9 C.T.	24492	.311	9.49	31	12.677	1960	393	92	2	.143	56.1	13	.2	0.0	612

MODE	ID	----UNITS AS SPECIFIED IN THE 7-11-75 PROCEDURE---- HV	CHP	CTQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	---------PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1 I		16.6	0.0	0	4.3	R	R	.060	R	590	14.5	10.2	3.8	.3	5.4	0.0
2 25		19.5	23.1	61	21.1	.913	6.9	.063	.555	2000	14.0	2.0	4.3	4.9	8.9	6.9
3 55		9.2	59.2	142	31.0	.522	10.2	.066	.398	2005	15.3	11.0	16.5	34.6	24.9	30.9
4 25		19.6	24.0	63	20.9	.873	6.0	.063	.531	2000	15.9	1.3	4.1	4.7	8.8	7.1
5 10		17.2	10.8	28	14.9	1.520	5.2	.062	.925	1995	16.2	.5	2.0	1.9	5.1	2.9
6 25		19.6	24.0	63	21.0	.877	6.3	.063	.533	2000	14.0	1.4	4.4	5.0	8.8	7.1
7 90		2.5	87.6	229	42.4	.496	10.9	.069	.296	2005	14.5	17.3	58.3	44.1	26.3	38.9
8 25		19.9	24.0	63	20.1	.837	6.1	.063	.509	2000	15.8	1.1	4.5	4.8	8.4	7.2
9 CT		24.1	0.0	0	4.3	R	R	.061	R	2000	14.9	55.2	2.1	.1	3.9	0.0
1 I		16.9	0.0	0	4.4	R	R	.061	R	590	14.3	10.5	4.4	.4	5.6	0.0
2 25		19.5	24.2	61	21.0	.905	6.7	.063	.551	2000	15.9	1.9	4.2	5.1	8.9	7.0
3 55		9.3	53.5	140	30.5	.570	10.9	.065	.397	2005	15.5	10.6	12.3	34.6	24.6	30.6
4 25		19.6	24.0	63	20.6	.859	9.9	.063	.522	2000	15.9	1.9	3.8	3.9	8.7	7.2
5 10		17.9	9.3	24	15.9	1.716	6.1	.061	1.044	1995	14.3	.6	2.2	1.9	5.0	2.1
6 25		19.6	23.2	61	20.6	.888	6.3	.063	.540	2000	15.8	1.3	4.3	4.8	8.7	7.0
7 90		2.9	84.2	234	43.3	.486	10.6	.069	.295	2005	14.9	14.2	63.9	45.3	26.9	39.2
8 25		19.8	23.2	61	20.0	.862	6.9	.062	.529	2000	16.0	1.0	3.5	4.9	8.5	7.0
9 CT		24.1	0.0	0	4.1	R	R	.060	R	2000	14.8	53.5	1.8	.1	3.2	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 5.7 36 12.2

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 5.6 38 12.3

TWO CYCLE COMPOSITE -						
HC- FID	0.35(5.7) + 0.65(5.6) =	5.603	G/KW	HR	(4.178	85)
CO- NDIR	0.35(36.1) + 0.65(38.5) =	37.632	G/KW	HR	(28.063	85)
NOX-CL	0.35(12.2) + 0.65(12.3) =	12.295	G/KW	HR	(9.131	85)
	HC + NOX =	17.898	G/KW	HR	(13.310	85)
	SFC =	.932	KG/KW	HR	(.710	85)

ID =

TABLE C-12. MASS EMISSIONS BY NINE-MODE EPA - METRIC UNITS

1975 CHEVROLET 350-CID HD ENGINE---PROJECT 11-9311

ENGINE-20 TEST-2007 RUN-1 11-30-77 EMISSIONS CONTROL SYSTEM K= .828 HUM= 9.8 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NOX-CL	CKW	VAC. MM
1 IDLE	680	.100	9.69	90	9.869	1592	12	31	2	.232	2.7	7	.9	0.0	919
2 25 PCT T	209	.286	12.12	195	12.928	8528	16	396	37	.077	1.2	30	2.8	18.2	323
3 55 PCT T	29	.090	12.18	690	12.272	12791	3	189	148	.197	.9	28	29.1	39.0	150
4 25 PCT T	88	.178	11.77	260	11.958	8029	7	242	98	.077	.5	19	3.7	17.9	335
5 10 PCT T	178	.215	11.17	90	11.409	6219	11	236	13	.057	.6	13	.8	7.1	396
6 25 PCT T	107	.201	11.69	257	11.902	8029	8	273	98	.077	.6	21	3.7	17.9	338
7 90 PCT T	13	.389	19.79	763	15.180	20003	2	1035	276	.113	.2	117	31.2	63.5	98
8 25 PCT T	27	.128	11.86	237	11.991	7802	2	169	92	.077	.2	13	3.3	17.9	340
9 C.T.	9690	.010	.12	9	.595	0	0	0	0	.193	0.0	0	0.0	0.0	599
1 IDLE	1155	.079	9.98	36	9.685	1588	21	26	2	.232	9.8	6	.9	0.0	922
2 25 PCT T	399	.369	11.83	191	12.238	8982	27	517	36	.077	2.0	40	2.8	18.2	320
3 55 PCT T	52	.093	12.47	717	12.569	12882	6	193	202	.197	.9	28	29.7	39.5	150
4 25 PCT T	113	.181	11.69	255	11.889	7938	8	299	97	.077	.6	19	3.6	17.7	338
5 10 PCT T	202	.218	11.10	96	11.390	6260	12	293	15	.057	.7	19	.8	7.9	396
6 25 PCT T	126	.210	11.75	250	11.979	8029	9	284	96	.077	.7	22	3.5	17.7	338
7 90 PCT T	29	.371	19.79	817	15.169	20099	9	993	298	.113	.9	112	33.6	63.8	98
8 25 PCT T	90	.127	11.85	250	11.981	7938	3	169	96	.077	.2	13	3.5	18.0	338
9 C.T.	9690	.012	.09	6	.567	0	0	0	0	.193	0.0	0	0.0	0.0	599

MODE	ID	----UNITS AS SPECIFIED IN THE 7-11-75 PROCEDURE---- KW	CHP	CTQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	--------PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1	I	16.3	0.0	0	3.9	R	R	.095	R	565	22.1	92.0	2.9	.5	9.9	0.0
2	25	12.7	29.9	69	18.8	.772	1.5	.056	.970	2000	17.7	18.8	12.3	3.8	8.9	7.4
3	55	5.9	52.3	137	28.2	.539	3.8	.056	.328	2005	18.0	6.9	11.2	38.8	25.6	30.5
4	25	13.2	29.0	63	17.7	.738	2.0	.059	.999	2000	18.9	7.9	7.5	9.9	8.9	7.3
5	10	15.6	9.5	25	13.7	1.938	1.9	.052	.879	2000	19.3	9.5	5.9	1.0	9.8	2.2
6	25	13.3	29.0	63	17.7	.737	2.0	.059	.998	2000	18.5	9.6	8.5	9.9	8.9	7.3
7	90	1.9	85.2	223	99.1	.518	3.3	.068	.315	2010	19.7	3.9	97.0	91.7	30.8	38.2
8	25	13.9	23.3	61	17.2	.738	1.8	.059	.999	2000	18.9	2.3	5.2	9.9	8.2	7.1
9	CT	23.6	0.0	0	0.0	I	I	.003	I	2000	350.5	0.0	0.0	0.0	0.0	0.0
1	I	16.6	0.0	0	3.5	R	R	.099	R	570	22.5	96.0	2.9	.5	5.0	0.0
2	25	12.6	29.5	69	18.7	.769	1.5	.056	.965	2000	18.0	19.6	15.7	3.6	8.8	7.9
3	55	5.9	53.0	139	28.9	.536	3.8	.057	.326	2010	17.6	8.9	11.2	38.1	25.6	30.6
4	25	13.3	23.8	62	17.5	.737	2.0	.059	.998	2005	18.5	6.2	7.9	9.6	8.3	7.2
5	10	15.6	9.9	26	13.8	1.388	1.5	.052	.895	2000	19.9	6.7	5.5	1.1	9.8	2.2
6	25	13.3	23.8	62	17.7	.799	1.9	.059	.953	2005	18.9	6.9	8.6	9.5	8.9	7.2
7	90	1.9	85.6	223	99.3	.518	3.5	.068	.315	2015	19.7	3.9	99.1	93.1	30.8	38.0
8	25	13.3	29.2	63	17.5	.729	1.9	.059	.991	2005	18.9	2.2	5.1	9.5	8.3	7.3
9	CT	23.6	0.0	0	0.0	I	I	.003	I	2005	367.9	0.0	0.0	0.0	0.0	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- .3 13 9.0

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- .6 13 9.1

TWO CYCLE COMPOSITE - HC- FID 0.35(.3) + 0.65(.6) = .477 G/KW HR (.356 BS)

CO- NDIR 0.35(13.2) + 0.65(13.5) = 13.377 G/KW HR (9.975 BS)

NOX-CL 0.35(9.3) + 0.65(9.1) = 9.079 G/KW HR (3.092 BS)

HC + NOX = 9.557 G/KW HR (3.398 BS)

ID = SFC = .390 KG/KW HR (.691 BS)

TABLE C-13. MASS EMISSIONS BY NINE-MODE EPA - METRIC UNITS

1975 CHEVROLET 350-CID HD ENGINE---PROJECT 11-9311
ENGINE-20 TEST-2007 RUN-2 EMISSIONS CONTROL SYSTEM K= .819 HUM= 9.5 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NOX-CL	CKW	VAC, MM
1 IDLE	588	.112	9.59	91	9.766	1633	11	38	2	.232	2.5	9	.9	0.0	917
2 25 PCT T	196	.223	12.12	272	12.365	8346	15	309	50	.077	1.1	23	3.8	18.0	330
3 55 PCT T	22	.092	12.25	705	12.345	13063	3	198	203	.197	.9	29	29.8	39.5	197
4 25 PCT T	86	.193	11.67	253	11.873	8210	7	270	98	.077	.5	21	3.7	17.8	333
5 10 PCT T	228	.237	10.99	96	11.252	6350	19	270	15	.057	.8	15	.8	6.9	399
6 25 PCT T	88	.231	11.79	250	11.988	8301	7	323	97	.077	.5	25	3.6	18.1	330
7 90 PCT T	13	.289	14.59	992	14.826	20230	2	784	350	.113	.2	89	39.5	64.1	96
8 25 PCT T	32	.137	11.67	267	11.811	7983	2	187	99	.077	.2	14	3.8	17.8	338
9 C.T.	9992	.011	.11	5	.620	0	0	0	0	.193	0.0	0	0.0	0.0	597
1 IDLE	1152	.079	9.28	37	9.489	1588	21	27	2	.232	4.9	6	.9	0.0	922
2 25 PCT T	900	.319	11.50	208	11.863	8437	32	958	90	.077	2.9	35	3.1	17.8	328
3 55 PCT T	59	.101	12.25	790	12.357	13063	7	215	213	.197	1.0	32	31.3	39.5	197
4 25 PCT T	119	.202	11.62	257	11.836	8255	9	285	99	.077	.7	22	3.8	17.8	335
5 10 PCT T	268	.237	11.62	93	11.887	6350	16	256	19	.057	.9	15	.8	6.9	396
6 25 PCT T	125	.239	11.67	263	11.918	8346	10	331	50	.077	.7	25	3.9	18.1	330
7 90 PCT T	29	.291	14.59	963	14.834	20185	4	800	357	.113	.4	90	90.3	64.2	96
8 25 PCT T	90	.137	11.67	285	11.811	8119	3	190	53	.077	.2	15	4.1	18.1	335
9 C.T.	9928	.011	.12	8	.629	0	0	0	0	.193	0.0	0	0.0	0.0	599

MODE	ID	----UNITS AS SPECIFIED IN THE 7-11-75 PROCEDURE---- MV	CMP	CTQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	--------PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1 I		16.9	0.0	0	3.6	R	R	.095	R	570	22.3	39.7	3.9	.5	5.1	0.0
2 25		13.0	29.1	63	18.9	.763	2.1	.056	.969	2000	17.8	18.1	10.9	9.5	8.6	7.3
3 55		5.8	52.9	138	28.8	.599	3.9	.056	.331	2015	17.9	6.1	12.9	39.9	25.7	30.6
4 25		13.1	23.8	62	18.1	.759	2.0	.059	.962	2005	18.5	8.1	9.2	9.3	8.5	7.2
5 10		15.5	9.2	24	14.0	1.519	1.6	.051	.929	2000	19.5	12.9	6.8	1.0	9.8	2.1
6 25		13.0	29.3	64	18.3	.754	2.0	.059	.959	2005	18.9	8.3	11.0	9.2	8.5	7.3
7 90		1.8	85.9	229	99.6	.519	9.1	.067	.316	2015	15.0	3.6	39.3	96.2	30.6	38.2
8 25		13.3	23.9	63	17.6	.737	2.1	.059	.998	2005	18.6	3.0	6.9	9.9	8.2	7.2
9 CT		23.5	0.0	0	0.0	I	I	.003	I	2005	335.9	0.0	0.0	0.0	0.0	0.0
1 I		16.6	0.0	0	3.5	R	R	.099	R	570	23.0	92.9	2.6	.9	9.9	0.0
2 25		12.9	23.9	63	18.6	.780	1.7	.059	.979	2000	18.5	21.9	19.7	3.5	8.7	7.2
3 55		5.8	52.9	138	28.8	.599	9.1	.056	.331	2010	17.9	9.0	13.2	35.7	25.7	30.6
4 25		13.2	23.9	63	18.2	.762	2.1	.059	.963	2005	18.6	6.3	9.1	9.3	8.5	7.2
5 10		15.6	9.2	24	14.0	1.516	1.5	.059	.922	2000	18.5	8.0	6.1	.9	9.8	2.1
6 25		13.0	29.3	64	18.9	.757	2.1	.059	.961	2005	18.5	6.6	10.6	9.9	8.6	7.9
7 90		1.8	86.1	229	99.5	.517	9.2	.067	.315	2015	15.0	3.7	37.6	96.0	30.5	38.2
8 25		13.2	29.3	69	17.9	.736	2.2	.059	.998	2005	18.6	2.1	6.1	9.7	8.9	7.9
9 CT		23.6	0.0	0	0.0	I	I	.003	I	2005	339.0	0.0	0.0	0.0	0.0	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- .3 12 9.5
SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- .6 13 9.7

TWO CYCLE COMPOSITE -

HC- FID	0.35(.3) + 0.65(.6) =	.508	G/KW HR	(.379 BS)
CO- NDIR	0.35(12.0) + 0.65(12.8) =	12.496	G/KW HR	(9.318 BS)
NOX-CL	0.35(9.5) + 0.65(9.7) =	9.621	G/KW HR	(3.996 BS)
	HC + NOX =	5.129	G/KW HR	(3.825 BS)
	SFC =	.399	KG/KW HR	(.698 BS)

ID =

TABLE C-14. MASS EMISSIONS BY NINE-MODE EPA - METRIC UNITS

1975 CHEVROLET 350-CID HD ENGINE---PROJECT 11-9311

ENGINE-20 TEST-2007 RUN-3 11-30-77 EMISSIONS CONTROL SYSTEM K= .000 HUM= 9.0 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NOX-CL	CKW	VAC. MM
1 IDLE	798	.098	9.61	36	9.789	1588	13	32	2	.232	3.1	7	.9	0.0	911
2 25 PCT T	199	.917	12.10	163	12.539	8709	15	585	30	.077	1.2	95	2.3	18.9	312
3 55 PCT T	95	.090	12.19	693	12.239	12882	9	191	199	.197	.6	28	28.5	39.2	150
4 25 PCT T	119	.175	11.37	250	11.558	8165	9	250	97	.077	.7	19	3.6	18.1	335
5 10 PCT T	298	.231	10.81	92	11.068	6260	15	263	19	.057	.9	15	.8	6.6	396
6 25 PCT T	118	.215	11.56	251	11.788	8210	9	302	96	.077	.7	23	3.6	17.9	330
7 90 PCT T	19	.292	14.98	905	14.774	20230	2	808	329	.113	.2	91	37.2	69.5	96
8 25 PCT T	30	.127	11.63	260	11.760	8079	2	176	97	.077	.2	19	3.6	17.9	335
9 C.T.	5298	.007	.10	5	.632	0	0	0	0	.193	0.0	0	0.0	0.0	597
1 IDLE	1296	.071	9.17	35	9.382	1588	29	29	2	.232	5.5	6	.9	0.0	919
2 25 PCT T	900	.983	11.71	175	12.238	8759	32	699	33	.077	2.5	59	2.6	18.9	317
3 55 PCT T	67	.097	12.25	730	12.359	13018	8	206	209	.197	1.2	30	30.0	39.3	150
4 25 PCT T	125	.199	11.56	262	11.773	8210	10	281	99	.077	.7	22	3.7	18.2	333
5 10 PCT T	288	.237	10.79	97	11.059	6305	18	273	15	.057	1.0	16	.8	6.6	396
6 25 PCT T	125	.227	11.58	260	11.821	8396	10	329	99	.077	.8	25	3.8	18.2	330
7 90 PCT T	29	.286	14.39	963	14.678	20321	4	798	359	.113	.4	90	90.0	69.5	96
8 25 PCT T	90	.126	11.67	277	11.800	8165	3	176	51	.077	.2	19	3.9	18.2	333
9 C.T.	5120	.008	.09	7	.610	0	0	0	0	.193	0.0	0	0.0	0.0	599

MODE	ID	----UNITS AS SPECIFIED IN THE 7-11-75 PROCEDURE---- HY	CMP	CTQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	---------PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1 I		16.2	0.0	0	3.5	R	R	.095	R	565	22.3	90.8	3.1	.9	9.9	0.0
2 25		12.3	29.6	65	19.2	.780	1.2	.057	.979	2000	17.6	15.9	18.5	2.9	9.0	7.9
3 55		5.9	52.6	137	28.9	.590	3.7	.055	.328	2010	18.0	8.0	11.5	35.6	25.9	30.3
4 25		13.2	29.3	64	18.0	.790	1.9	.053	.950	2005	19.0	9.1	7.9	9.5	8.9	7.9
5 10		15.6	8.9	23	13.8	1.556	1.6	.050	.997	2000	19.8	11.7	6.2	1.0	9.8	2.0
6 25		13.0	29.0	63	18.1	.755	2.0	.059	.960	2005	18.7	9.3	9.6	9.5	8.5	7.2
7 90		1.8	86.5	225	99.6	.516	3.9	.066	.319	2020	15.1	3.3	37.6	96.5	30.7	38.9
8 25		13.2	29.0	63	17.8	.790	2.0	.053	.950	2010	18.7	2.3	5.6	9.6	8.3	7.3
9 CT		23.5	0.0	0	0.0	I	I	.003	I	2010	329.5	0.0	0.0	0.0	0.0	0.0
1 I		16.5	0.0	0	3.5	R	R	.093	R	560	23.2	99.8	2.2	.9	9.9	0.0
2 25		12.5	29.7	65	19.3	.782	1.9	.056	.975	2000	18.0	14.9	21.0	3.0	9.0	7.9
3 55		5.9	52.7	138	28.7	.599	3.9	.056	.331	2010	17.9	9.9	11.8	35.2	25.5	30.3
4 25		13.1	29.9	64	18.1	.793	2.0	.053	.952	2005	18.7	6.0	8.5	9.9	8.9	7.3
5 10		15.6	8.9	23	13.9	1.566	1.7	.050	.953	2000	19.8	8.9	6.1	1.0	9.8	2.0
6 25		13.0	29.9	64	18.9	.755	2.0	.059	.959	2005	18.6	6.1	9.8	9.9	8.6	7.3
7 90		1.8	86.5	225	99.8	.518	9.1	.066	.315	2020	15.2	3.5	35.3	97.0	30.6	38.2
8 25		13.1	29.9	64	18.0	.738	2.1	.059	.999	2005	18.7	1.9	5.3	9.6	8.9	7.3
9 CT		23.6	0.0	0	0.0	I	I	.003	I	2005	391.3	0.0	0.0	0.0	0.0	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- .9 13 9.3

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- .7 19 9.5

TWO CYCLE COMPOSITE - HC- FID 0.35(.9) + 0.65(.7) = .566 G/KW HR (.422 BS)

CO- NDIR 0.35(12.9) + 0.65(13.6) = 13.359 G/KW HR (9.962 BS)

NOX-CL 0.35(9.3) + 0.65(9.5) = 9.939 G/KW HR (3.307 BS)

HC + NOX = 5.000 G/KW HR (3.729 BS)

ID = SFC = .399 KG/KW HR (.697 BS)

TABLE C-15. MASS EMISSIONS BY NINE-MODE EPA - METRIC UNITS

1975 CHEVROLET 350-CID HD ENGINE---PROJECT 11-9311

ENGINE-20 TEST-2006 RUN-01 11-28-77 EMISSION CONTROL SYSTEM WITH CATALYST Ka .981 HUMa 9.9 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NOX-CL	CKW	VAC. MM
1 IDLE	5	.001	9.90	96	9.901	2177	0	0	8	.232	.0	0	.8	0.0	399
2 25 PCT T	9	.001	10.97	231	10.972	6759	1	2	60	.077	.1	0	9.6	18.3	317
3 55 PCT T	0	.001	8.30	965	8.301	13880	0	3	253	.197	0.0	0	37.2	39.6	132
4 25 PCT T	7	.001	10.88	283	10.881	8079	1	1	68	.077	.0	0	5.3	17.2	340
5 10 PCT T	21	.001	10.79	87	10.793	6350	1	1	17	.057	.1	0	1.0	6.3	401
6 25 PCT T	10	.003	10.99	303	10.999	8165	1	4	73	.077	.1	0	5.6	17.8	338
7 90 PCT T	1	.002	19.97	585	19.972	20366	0	6	259	.113	.0	1	29.3	63.6	93
8 25 PCT T	3	.003	11.10	300	11.103	8165	0	4	72	.077	.0	0	5.5	17.8	340
9 C.T.	5	.001	.68	12	.681	0	0	0	0	.193	0.0	0	0.0	0.0	579
1 IDLE	20	.001	9.73	32	9.733	1905	0	0	2	.232	.1	0	.5	0.0	909
2 25 PCT T	22	.001	11.37	229	11.379	8301	2	2	59	.077	.1	0	9.2	17.2	333
3 55 PCT T	2	.002	12.73	529	12.732	13608	0	4	189	.197	.0	1	27.1	39.2	137
4 25 PCT T	8	.001	11.33	307	11.332	8301	1	1	73	.077	.0	0	5.6	17.8	335
5 10 PCT T	23	.001	10.89	97	10.893	6350	1	1	19	.057	.1	0	1.1	6.3	401
6 25 PCT T	11	.001	11.12	293	11.122	8079	1	1	69	.077	.1	0	5.3	17.2	338
7 90 PCT T	1	.001	19.99	602	19.991	20638	0	3	270	.113	.0	0	30.6	64.3	91
8 25 PCT T	3	.001	11.12	310	11.121	7938	0	1	72	.077	.0	0	5.5	16.7	343
9 C.T.	6	.001	.72	11	.722	0	0	0	0	.193	0.0	0	0.0	0.0	589

MODE	ID	----UNITS AS SPECIFIED IN THE 7-11-75 PROCEDURE---- MV	CMP	CTQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	--------PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1 I		15.7	0.0	0	9.8	R	R	.095	R	670	22.1	9.0	9.2	.9	6.5	0.0
2 25		12.5	29.6	69	19.3	.786	2.5	.050	.978	2000	20.0	19.7	7.9	5.2	8.7	7.5
3 55		5.2	53.1	139	30.6	.577	9.8	.038	.351	2005	26.2	0.0	20.9	91.7	26.3	30.9
4 25		13.9	23.8	61	17.8	.773	3.0	.050	.970	2000	20.2	19.2	2.6	5.9	8.0	7.0
5 10		15.8	8.5	22	19.0	1.656	2.0	.099	1.007	2000	20.3	25.0	2.8	1.1	9.7	1.9
6 25		13.3	23.8	63	18.0	.755	3.1	.050	.959	2000	20.0	20.9	19.8	6.3	8.1	7.3
7 90		1.7	85.3	222	99.9	.527	3.1	.067	.320	2015	19.9	5.7	32.6	32.8	29.6	38.2
8 25		13.9	23.9	63	18.0	.755	3.0	.051	.959	2000	19.8	6.1	19.6	6.2	8.1	7.3
9 CT		22.6	0.0	0	0.0	I	I	.003	I	2000	308.1	0.0	0.0	0.0	0.0	0.0
1 I		15.9	0.0	0	9.2	R	R	.095	R	630	22.5	19.5	5.7	.6	5.8	0.0
2 25		13.1	23.1	61	18.3	.793	2.9	.052	.982	2000	19.9	26.9	10.9	5.3	8.9	7.1
3 55		5.9	52.6	137	30.0	.571	3.5	.058	.397	2010	17.9	6.9	39.1	33.9	25.2	30.8
4 25		13.2	23.9	63	18.3	.767	3.1	.051	.967	2000	19.9	9.8	7.0	7.1	8.9	7.3
5 10		15.8	8.5	22	19.0	1.659	2.2	.099	1.006	2000	20.3	16.6	9.2	1.3	9.7	1.9
6 25		13.3	23.1	61	17.8	.771	3.0	.051	.969	2000	19.8	13.3	7.0	6.7	8.1	7.1
7 90		1.6	86.3	229	95.5	.527	3.2	.067	.321	2020	19.9	3.5	19.9	38.2	30.5	38.9
8 25		13.5	22.3	59	17.5	.784	3.3	.051	.977	2000	19.8	3.6	6.8	7.0	8.0	6.9
9 CT		23.0	0.0	0	0.0	I	I	.003	I	2005	291.1	0.0	0.0	0.0	0.0	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- .0 0 9.8

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- .0 0 9.8

TWO CYCLE COMPOSITE = HC= FID 0.35(.0) + 0.65(.0) = .029 G/KW HR (.018 G/HP HR)

CO= NDIR 0.35(.1) + 0.65(.1) = .092 G/KW HR (.069 G/HP HR)

NOX-CL 0.35(9.8) + 0.65(9.3) = 9.478 G/KW HR (3.339 G/HP HR)

HC + NOX = 9.502 G/KW HR (3.357 G/HP HR)

SFC = .910 KG/KW HR (.679 G/HP HR)

ID =

TABLE C-16. MASS EMISSIONS BY NINE-MODE EPA - METRIC UNITS

1975 CHEVROLET 350-CID HD ENGINE---PROJECT 11-9311

ENGINE-20 TEST-2006 RUN-02 11-28-77 EMISSION CONTROL SYSTEM WITH CATALYST KH= .979 HUMH= 9.8 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NOX-CL	CRN	VAC. MM
1 IDLE	5	.006	9.80	93	9.806	2087	0	2	3	.232	.0	1	.7	0.0	901
2 25 PCT T	13	.005	11.21	220	11.216	8895	1	7	56	.077	.1	1	4.3	18.9	315
3 55 PCT T	0	.005	12.61	935	12.615	13835	0	10	155	.197	0.0	1	22.8	39.3	135
4 25 PCT T	6	.009	10.81	256	10.815	7938	0	6	61	.077	.0	0	4.7	17.2	390
5 10 PCT T	20	.009	10.77	93	10.776	6950	1	9	18	.057	.1	0	1.0	6.9	896
6 25 PCT T	8	.003	11.08	285	11.089	8119	1	5	68	.077	.0	0	5.2	17.8	338
7 90 PCT T	0	.001	19.86	515	19.861	20321	0	2	229	.113	0.0	0	25.9	63.8	93
8 25 PCT T	3	.003	10.99	293	10.999	7893	0	5	68	.077	.0	0	5.3	17.3	393
9 C.T.	5	.001	.72	7	.721	0	0	0	0	.193	0.0	0	0.0	0.0	582
1 IDLE	16	.001	9.73	36	9.733	1819	0	1	2	.232	.1	0	.5	0.0	906
2 25 PCT T	25	.003	11.63	191	11.636	8437	2	6	45	.077	.2	0	3.5	17.3	330
3 55 PCT T	1	.003	12.73	517	12.733	13799	0	7	101	.197	.0	1	20.7	39.9	135
4 25 PCT T	8	.003	11.31	258	11.319	8029	1	4	60	.077	.0	0	4.6	17.3	390
5 10 PCT T	27	.001	10.75	92	10.759	6260	2	2	17	.057	.1	0	1.0	6.9	901
6 25 PCT T	12	.001	11.96	255	11.963	8166	1	2	59	.077	.1	0	4.5	18.0	338
7 90 PCT T	1	.004	19.99	350	19.994	20502	0	10	156	.113	.0	1	17.6	64.0	93
8 25 PCT T	3	.001	11.37	270	11.371	7983	0	1	62	.077	.0	0	4.7	17.4	393
9 C.T.	6	.001	.76	9	.761	0	0	0	0	.193	0.0	0	0.0	0.0	592

MODE	ID	----UNITS AS SPECIFIED IN THE 7-11-75 PROCEDURE---- HV	CHP	CTQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	--------PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1 I		15.8	0.0	0	9.6	R	R	.095	R	660	22.3	9.2	12.7	1.0	6.3	0.0
2 25		12.9	29.6	65	19.5	.291	2.3	.051	.381	2000	14.6	29.7	13.0	4.2	8.8	7.5
3 55		5.3	52.7	138	30.5	.579	3.0	.057	.352	2010	17.5	0.0	39.6	32.6	26.9	30.7
4 25		13.9	23.1	61	17.5	.757	2.7	.099	.960	2000	20.3	12.7	10.8	6.7	7.9	7.1
5 10		15.6	9.3	29	14.0	1.513	1.9	.099	.920	2000	20.9	25.2	5.8	1.5	9.7	2.1
6 25		13.3	23.9	63	17.9	.749	2.9	.050	.955	2000	19.8	17.0	8.9	7.5	8.1	7.3
7 90		1.7	85.6	223	99.8	.529	2.7	.067	.318	2015	15.0	0.0	6.5	32.0	29.8	38.3
8 25		13.5	23.2	61	17.9	.799	3.0	.050	.955	2005	20.0	6.2	8.2	7.5	7.9	7.1
9 CT		22.9	0.0	0	0.0	I	I	.003	I	2000	291.1	0.0	0.0	0.0	0.0	0.0
1 I		16.0	0.0	0	9.0	R	R	.096	R	600	22.5	15.0	3.7	.8	5.5	0.0
2 25		13.0	23.2	61	18.6	.803	2.0	.053	.988	2000	18.9	30.7	10.9	5.5	8.5	7.1
3 55		5.3	53.5	140	30.3	.566	3.9	.058	.399	2010	17.9	3.5	30.9	42.3	26.5	31.1
4 25		13.9	23.2	61	17.7	.762	2.6	.051	.969	2005	19.9	9.6	9.3	7.3	8.1	7.1
5 10		15.8	8.5	22	13.8	1.619	2.1	.099	.985	2005	20.9	19.6	2.8	1.6	9.7	1.9
6 25		13.3	24.1	63	18.0	.748	2.5	.052	.955	2010	19.2	14.5	9.7	7.2	8.2	7.3
7 90		1.7	85.9	223	95.2	.526	1.8	.067	.320	2020	14.9	3.5	39.8	27.9	30.9	38.9
8 25		13.5	23.3	61	17.6	.756	2.7	.052	.959	2010	19.9	3.6	4.0	7.5	8.1	7.1
9 CT		23.3	0.0	0	0.0	I	I	.009	I	2010	276.0	0.0	0.0	0.0	0.0	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- .0 0 3.8

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- .0 0 3.9

TWO CYCLE COMPOSITE -

HC- FID 0.35(.0) + 0.65(.0) = .023 G/KW HR (.017 BS)

CO- NDIR 0.35(.2) + 0.65(.2) = .198 G/KW HR (.147 BS)

NOX-CL 0.35(3.8) + 0.65(3.9) = 3.522 G/KW HR (2.627 BS)

HC + NOX = 3.595 G/KW HR (2.699 BS)

SFC = .906 KG/KW HR (.668 BS)

ID =

TABLE C-17. MASS EMISSIONS BY NINE-MODE EPA - METRIC UNITS

1975 CHEVROLET 350-CID HD ENGINE---PROJECT 21-9311

ENGINE-20 TEST-2006 RUN-03 11-28-77 EMISSION CONTROL SYSTEM WITH CATALYST K= 1.029 HUM= 11.8 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NOX-CL	CRK	VAC. MM
1 IDLE	9	.001	9.69	91	9.692	2268	0	0	3	.232	.1	0	.8	0.0	391
2 25 PCT T	19	.001	11.69	223	11.692	8936	1	1	58	.077	.1	0	4.5	18.9	312
3 55 PCT T	0	.001	12.73	985	12.731	13789	0	1	179	.197	0.0	0	26.2	39.2	135
4 25 PCT T	6	.000	10.95	295	10.951	8119	0	0	74	.077	.0	0	5.7	17.3	338
5 10 PCT T	20	.001	10.77	87	10.773	6305	1	1	17	.057	.1	0	1.0	5.8	401
6 25 PCT T	9	.001	11.21	290	11.212	8119	1	1	71	.077	.1	0	5.5	17.9	338
7 90 PCT T	0	.001	19.99	565	19.991	20502	0	2	263	.113	0.0	0	29.7	63.8	93
8 25 PCT T	3	.002	11.25	290	11.253	7983	0	1	70	.077	.0	0	5.9	17.9	340
9 C.T.	5	.000	.72	9	.721	0	0	0	0	.193	0.0	0	0.0	0.0	589
1 IDLE	19	.001	10.18	97	10.182	1678	0	0	3	.232	.1	0	.6	0.0	906
2 25 PCT T	30	.001	12.29	193	12.299	8759	2	1	35	.077	.2	0	2.7	18.5	315
3 55 PCT T	1	.001	12.73	512	12.731	13972	0	1	189	.197	.1	0	27.1	38.9	137
4 25 PCT T	9	.001	11.23	252	11.232	7983	1	1	61	.077	.1	0	4.7	16.7	343
5 10 PCT T	26	.001	11.06	106	11.063	6486	2	1	21	.057	.1	0	1.2	6.9	396
6 25 PCT T	12	.000	11.60	290	11.601	8210	1	0	58	.077	.1	0	4.4	17.3	335
7 90 PCT T	0	.001	19.99	535	19.991	20593	0	2	250	.113	0.0	0	28.2	64.1	93
8 25 PCT T	3	.001	11.96	250	11.961	8165	0	1	61	.077	.0	0	4.7	17.9	338
9 C.T.	6	.001	.76	10	.762	0	0	0	0	.193	0.0	0	0.0	0.0	599

MODE	ID	----UNITS AS SPECIFIED IN THE 7-11-75 PROCEDURE---- MV	CMP	CTQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	---------PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1 I		15.9	0.0	0	0.0	R	R	.099	R	690	22.5	16.2	9.9	1.0	0.6	0.0
2 25		12.3	29.7	65	19.7	.298	2.9	.053	.985	2000	18.9	27.7	10.2	5.7	8.8	7.6
3 55		5.3	52.6	138	30.9	.578	3.9	.057	.351	2005	17.9	0.0	15.3	33.3	26.0	30.7
4 25		13.3	23.2	61	17.9	.273	3.3	.050	.970	2000	20.1	11.6	1.1	7.3	8.0	7.1
5 10		15.8	7.7	20	13.9	1.299	2.3	.099	1.099	2000	20.9	22.3	3.2	1.3	9.6	1.7
6 25		13.3	29.0	63	17.9	.297	3.0	.051	.955	2000	19.6	16.8	4.7	7.0	8.0	7.3
7 90		1.7	85.6	229	95.2	.528	3.1	.067	.321	2016	19.9	0.0	26.8	37.7	29.9	30.3
8 25		13.9	29.0	63	17.6	.273	3.0	.051	.996	2000	19.6	5.5	29.2	6.8	7.9	7.3
9 CI		23.0	0.0	0	0.0	I	I	.003	I	2000	291.9	0.0	0.0	0.0	0.0	0.0
1 I		16.0	0.0	0	3.7	R	R	.096	R	600	21.5	11.7	5.0	.8	5.1	0.0
2 25		12.9	29.8	65	19.3	.279	1.9	.056	.979	2000	18.0	36.6	7.1	3.6	8.9	7.6
3 55		5.9	57.1	136	29.7	.570	4.6	.058	.397	2010	17.9	3.5	20.2	36.8	26.0	30.5
4 25		13.5	22.5	59	17.6	.289	2.8	.051	.977	2000	19.6	10.9	12.6	6.9	8.1	6.9
5 10		15.6	9.3	29	14.8	1.539	2.3	.058	.936	2040	19.9	19.2	9.3	1.6	9.9	2.1
6 25		13.2	23.2	61	18.1	.279	2.5	.053	.979	2000	19.0	19.5	1.9	6.6	8.3	7.1
7 90		1.7	85.9	223	95.9	.528	3.0	.067	.321	2020	19.9	0.0	36.3	38.9	30.6	30.7
8 25		13.3	23.3	61	18.0	.273	2.6	.052	.970	2005	19.2	3.6	12.8	6.3	8.3	7.1
9 CI		23.9	0.0	0	0.0	I	I	.009	I	2005	275.8	0.0	0.0	0.0	0.0	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- .0 0 9.2

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- .0 0 9.0

TWO CYCLE COMPOSITE - HC- FID 0.35(.0) + 0.65(.0) = .029 G/KW HR (.018 85)

CO- NDIR 0.35(.1) + 0.65(.0) = .097 G/KW HR (.035 85)

NOX-CL 0.35(9.2) + 0.65(9.0) = 9.081 G/KW HR (3.093 85)

HC + NUX = 9.185 G/KW HR (3.061 85)

ID = SFC = .909 KG/KW HR (.673 85)

APPENDIX D

CHASSIS VERSION NINE-MODE FTP RESULTS

TABLE D-1	Summary of the Results
TABLES D-2 through D-7	Raw Exhaust Modal Results
TABLES D-8 through D-13	CVS Diluted Bagged Results

TABLE D-1. CHASSIS VERSION 9-MODE FTP RESULTS

Test No.	Run No.	Sampling Method	Engine Description	Emissions, grams/kW hr HC	CO	NO_x	HC + NO_x	Fuel kg/kW hr
01	2	Modal	Emissions Control System	0.982	18.254	3.292	4.274	0.511
	3			0.852	18.279	3.302	4.154	0.511
			Average	0.92	18.27	3.30	4.21	0.511
02	2	Modal	ECS with Catalyst	0.066	0.381	2.782	2.848	0.565
	3			0.069	0.209	3.322	3.391	0.557
			Average	0.07	0.30	3.05	3.120	0.561
09	1	Modal	Baseline Configuration	5.945	27.385	13.571	19.516	0.489
	2			6.190	24.251	13.573	19.763	0.498
			Average	6.07	25.82	13.57	19.64	0.494
				grams/minute				
01	2&3	Modal	ECS	0.19	3.8	0.69	------	106
02	2&3	Modal	ECS with Catalyst	0.01	0.1	0.57	------	104
09	1&2	Modal	Baseline	1.64	7.0	3.66	------	134
01	2&3	Bagged	ECS	0.64	4.9	0.72	------	101
02	2&3	Bagged	ECS with Catalyst	0.12	0.8	0.67	------	102
09	1&2	Bagged	Baseline	1.66	7.8	3.18	------	132
			Stationary Dynamometer Results					
				grams/kW hr				kg/kW hr
2004	2&3	Modal	ECS	0.98	19.83	3.82	4.80	0.510
2005	1&2	Modal	ECS with Catalyst	0.12	0.44	3.94	4.06	0.554
2001	1-3	Modal	Baseline	5.31	19.40	12.61	17.92	0.469

TABLE D-2. MASS EMISSIONS BY MODE-MODE FTP -METRIC UNITS

ENGINE-20 TEST-1 RUN-2 EMIS. CONT. 5%. IN C-60 12-21-77 R = .688 NUM = 1.2 G/BG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NO2	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NO2-CL	HC	NP
1 IDLE	611	.066	8.19	90	8.317	1963	11	23	2	.232	2.5	5	.5	0	0
2 16 MG	571	.256	10.99	85	10.753	6601	35	718	17	.077	2.7	29	1.3	7	9
3 10 MG	51	.199	12.37	550	12.575	10719	9	393	156	.193	.6	50	22.9	28	3
4 16 MG	195	.196	10.99	105	11.201	6601	9	239	21	.077	.7	18	1.6	7	9
5 19 MG	265	.157	10.88	35	11.069	9859	12	139	5	.052	.7	8	.3	0	0
6 16 MG	199	.189	10.88	95	11.078	6601	8	222	19	.077	.6	17	1.4	7	9
7 3 MG	70	.350	19.98	695	19.832	18819	3	857	272	.113	.3	101	30.7	55	79
8 16 MG	22	.069	11.33	105	11.501	6601	1	80	20	.077	.1	6	1.6	7	9
9 C.T.	5196	.036	.21	10	.765	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KM MI----------											.7	19	9.9		
1 IDLE	528	.061	8.00	35	8.159	1963	17	22	2	.232	3.9	5	.5	0	0
2 16 MG	826	.256	10.32	85	10.649	6601	51	320	17	.077	3.9	25	1.3	7	9
3 10 MG	90	.212	12.37	970	12.591	10719	8	369	133	.193	1.1	53	19.5	28	30
4 16 MG	199	.199	10.88	100	11.099	6601	12	290	20	.077	.9	18	1.5	7	9
5 19 MG	189	.196	10.77	35	10.935	9859	8	131	5	.052	.5	7	.3	0	0
6 16 MG	189	.193	10.77	95	10.982	6601	11	235	19	.077	.9	18	1.5	7	9
7 3 MG	90	.309	19.98	655	19.793	18819	5	795	272	.113	.6	90	31.3	55	79
8 16 MG	51	.079	11.21	105	11.289	6601	3	87	20	.077	.2	7	1.6	7	9
9 C.T.	5003	.038	.21	10	.758	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KM MI----------											1.0	18	9.8		
1 IDLE	959	.061	8.00	35	8.156	1963	17	22	2	.232	3.9	5	.5	0	0
2 16 MG	905	.250	10.33	80	10.670	6601	56	312	16	.077	3.8	24	1.2	7	9
3 10 MG	112	.215	12.25	500	12.476	10719	10	373	193	.193	1.9	55	21.4	28	30
4 16 MG	215	.209	10.88	115	11.110	6601	13	250	23	.077	1.0	19	1.7	7	9
5 19 MG	220	.187	10.77	35	10.929	9859	10	163	5	.052	.6	10	.3	0	0
6 16 MG	203	.191	10.88	100	11.081	6601	12	218	20	.077	.9	17	1.5	7	9
7 3 MG	99	.316	19.98	655	19.800	18819	6	810	276	.113	.7	92	31.6	55	79
8 16 MG	62	.079	11.33	110	11.510	6601	5	86	21	.077	.3	7	1.6	7	9
9 C.T.	9835	.038	.21	10	.736	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KM MI----------											1.1	18	9.8		
1 IDLE	963	.058	8.00	35	8.159	1963	17	21	2	.232	3.9	5	.5	0	0
2 16 MG	878	.250	10.33	80	10.668	6601	55	312	16	.077	3.8	24	1.2	7	9
3 10 MG	120	.227	12.25	510	12.489	10719	10	399	195	.193	1.9	58	21.9	28	30
4 16 MG	216	.199	10.88	105	11.101	6601	13	290	21	.077	1.0	18	1.6	7	9
5 19 MG	217	.187	10.77	35	10.988	9859	10	167	5	.052	.6	10	.3	0	0
6 16 MG	220	.193	10.77	100	10.985	6601	13	235	20	.077	1.0	18	1.5	7	9
7 3 MG	55	.296	19.98	675	19.781	18819	3	760	285	.113	.3	86	32.2	55	79
8 16 MG	52	.079	11.21	115	11.290	6601	3	87	22	.077	.3	7	1.7	7	9
9 C.T.	9783	.036	.21	10	.720	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KM MI----------											1.1	18	9.9		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)----------											.8	18	9.7		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)----------											1.1	18	9.8		

FOUR CYCLE COMPOSITE -

HC- FID 0.36(.8) + 0.64(1.1) = .992 G/ KM MI (.732 BS)

CO- NDIR 0.36(18.3) + 0.64(18.2) = 18.259 G/ KM MI (13.612 BS)

NOP-CL 0.36(9.8) + 0.64(9.8) = 9.787 G/ KM MI (3.570 BS)

CORRECTED NO2 = 3.292 G/ KM MI (2.455 BS)

DFC = .511 KG/ KM MI (.890 BS)

TABLE D-3. MASS EMISSIONS BY NINE-MODE FTP -METRIC UNITS

ENGINE-20 TEST-1 RUN-3 EMIS. CONT. SYS. IN C-60 12-21-77 K = .685 HUM = 1.2 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NO2	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NO2-CL	KW	HP
1 IDLE	961	.079	8.38	90	8.505	1963	8	27	2	.232	1.8	6	.5	0	0
2 16 HG	918	.237	10.66	90	10.939	6601	25	289	18	.077	1.9	22	1.9	7	9
3 10 HG	36	.169	12.37	530	12.593	10719	3	292	150	.147	.9	93	22.1	28	38
4 16 HG	107	.175	11.10	110	11.286	6601	6	207	21	.077	.5	16	1.6	7	9
5 19 HG	79	.128	11.10	35	11.236	9859	3	112	5	.057	.2	6	.3	0	0
6 16 HG	25	.166	10.99	100	11.159	6601	2	194	20	.077	.1	15	1.5	7	9
7 3 HG	18	.350	19.98	650	19.832	18819	2	897	279	.113	.3	101	30.9	55	74
8 16 HG	22	.063	11.99	115	11.506	6601	1	73	22	.077	.1	6	1.7	7	9
9 C.T.	9618	.098	.18	5	.690	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											.9	17	9.8		
1 IDLE	869	.063	8.09	35	8.290	1963	15	23	2	.232	3.6	5	.5	0	0
2 14 HG	757	.269	10.55	85	10.895	6601	96	329	17	.077	3.5	25	1.3	7	9
3 10 HG	78	.205	12.99	975	12.703	10719	7	350	133	.147	1.0	51	19.6	28	38
4 16 HG	161	.199	11.10	110	11.316	6601	9	235	21	.077	.7	18	1.6	7	9
5 19 HG	212	.157	10.88	35	11.058	9859	9	139	5	.057	.5	8	.3	0	0
6 16 HG	150	.184	10.99	105	11.189	6601	9	219	21	.077	.7	17	1.6	7	9
7 3 HG	39	.309	19.98	725	19.793	18819	5	799	306	.113	.6	90	34.6	55	74
8 16 HG	38	.069	11.99	115	11.512	6601	2	79	22	.077	.2	6	1.7	7	9
9 C.T.	9618	.098	.18	10	.690	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											.9	18	9.9		
1 IDLE	877	.063	8.00	30	8.151	1963	16	23	2	.232	3.7	5	.9	0	0
2 14 HG	827	.276	10.99	85	10.798	6601	51	340	17	.077	3.9	26	1.3	7	9
3 10 HG	109	.193	12.37	535	12.579	10719	9	333	151	.147	1.9	99	22.2	28	38
4 16 HG	192	.205	10.99	105	11.215	6601	11	249	21	.077	.9	19	1.6	7	9
5 19 HG	181	.190	10.88	35	11.038	9859	8	124	5	.057	.5	7	.3	0	0
6 16 HG	179	.193	10.88	100	11.091	6601	10	232	20	.077	.8	18	1.5	7	9
7 3 HG	55	.357	19.98	650	19.842	18819	7	914	279	.113	.8	103	30.9	55	74
8 16 HG	99	.079	11.99	115	11.519	6601	3	85	22	.077	.2	7	1.7	7	9
9 C.T.	9989	.093	.18	5	.672	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											1.0	19	9.8		
1 IDLE	899	.063	8.00	30	8.153	1963	16	23	2	.232	3.7	5	.9	0	0
2 16 HG	791	.250	10.99	85	10.769	6601	98	309	17	.077	3.7	24	1.3	7	9
3 10 HG	112	.205	12.37	995	12.587	10719	10	353	149	.147	1.9	52	20.6	28	38
4 16 HG	221	.199	10.99	110	11.211	6601	13	237	22	.077	1.0	18	1.7	7	9
5 19 HG	190	.172	10.88	35	11.071	9859	8	152	5	.057	.5	9	.3	0	0
6 16 HG	61	.193	10.88	100	11.079	6601	4	233	20	.077	.3	18	1.5	7	9
7 3 HG	63	.336	19.98	660	19.822	18819	8	862	278	.113	.9	97	31.9	55	74
8 16 HG	77	.069	11.33	115	11.906	6601	4	80	22	.077	.3	6	1.7	7	9
9 C.T.	9233	.038	.18	5	.691	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											1.0	18	9.7		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)----------											.6	18	9.9		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 9)----------											1.0	19	9.8		

FOUR CYCLE COMPOSITE -

HC- FID 0.35(.6) + 0.65(1.0) = .852 G/ KW HR (.635 BS)

CO- NDIR 0.35(17.6) + 0.65(18.7) = 18.279 G/ KW HR (13.631 BS)

NO2-CL 0.35(9.9) + 0.65(9.8) = 9.817 G/ KW HR (3.592 BS)

CORRECTED NO2 = 3.302 G/ KW HR (2.462 BS)

SFC = .511 KG/ KW HR (.840 BS)

TABLE D-4. MASS EMISSIONS BY NINE-MODE FTP -METRIC UNITS

ENGINE-20 TEST-2 RUN-2 EMIS. CONT. SYS. W CAT C-60 12-21-77 K = .791 HUM = 2.5 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NO2	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NO2-CL	KW	HP
1 IDLE	23	.005	8.77	90	8.777	1592	0	2	2	.232	.1	0	.5	0	0
2 16 HG	53	.005	11.10	95	11.110	6396	3	5	18	.077	.2	0	1.4	4	5
3 10 HG	8	.005	12.73	540	12.735	10570	1	8	149	.147	.1	1	21.9	26	35
4 16 HG	19	.005	11.33	110	11.336	6396	1	5	21	.077	.1	0	1.6	4	5
5 19 HG	28	.005	11.33	95	11.337	9672	1	4	6	.057	.1	0	.4	0	0
6 16 HG	17	.005	11.33	105	11.336	6396	1	5	20	.077	.1	0	1.5	4	5
7 3 HG	3	.005	15.12	950	15.125	18688	0	11	185	.113	.0	1	20.4	54	72
8 16 HG	6	.005	11.67	115	11.675	6396	0	5	21	.077	.0	0	1.6	4	5
9 C.T.		.005	1.02	15	1.025	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											.1	0	9.5		
1 IDLE	11	.005	8.77	90	8.776	1592	0	2	2	.232	.0	0	.5	0	0
2 16 HG	53	.005	11.10	95	11.110	6396	3	5	18	.077	.2	0	1.4	4	5
3 10 HG	7	.005	12.85	525	12.855	10570	1	8	143	.147	.1	1	21.1	26	35
4 16 HG	18	.005	11.99	115	11.996	6396	1	5	21	.077	.1	0	1.6	4	5
5 19 HG	27	.005	11.99	95	11.997	9672	1	4	6	.057	.1	0	.3	0	0
6 16 HG	17	.005	11.99	105	11.996	6396	1	5	19	.077	.1	0	1.5	4	5
7 3 HG	3	.005	15.12	390	15.125	18688	0	11	139	.113	.0	1	15.8	54	72
8 16 HG	3	.005	11.67	115	11.675	6396	0	5	21	.077	.0	0	1.6	4	5
9 C.T.		.005	1.02	20	1.025	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											.1	0	9.0		
1 IDLE	10	.005	8.87	95	8.876	1592	0	2	3	.232	.0	0	.6	0	0
2 16 HG	53	.005	11.10	95	11.110	6396	3	5	18	.077	.2	0	1.4	4	5
3 10 HG	8	.005	12.85	530	12.855	10570	1	8	145	.147	.1	1	21.3	26	35
4 16 HG	17	.005	11.99	115	11.996	6396	1	5	21	.077	.1	0	1.6	4	5
5 19 HG	28	.005	11.99	95	11.997	9672	1	4	6	.057	.1	0	.3	0	0
6 16 HG	18	.005	11.99	110	11.996	6396	1	5	20	.077	.1	0	1.6	4	5
7 3 HG	7	.005	15.12	220	15.125	18688	1	11	90	.113	.1	1	10.2	54	72
8 16 HG	6	.002	11.67	115	11.673	6396	0	3	21	.077	.0	0	1.6	4	5
9 C.T.		.002	1.06	20	1.063	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											.1	0	3.5		
1 IDLE	13	.005	8.77	95	8.776	1592	0	2	3	.232	.1	0	.6	0	0
2 16 HG	60	.005	11.10	95	11.111	6396	3	5	18	.077	.3	0	1.4	4	5
3 10 HG	11	.005	12.85	530	12.856	10570	1	8	145	.147	.1	1	21.3	26	35
4 16 HG	21	.005	11.99	110	11.997	6396	1	5	20	.077	.1	0	1.6	4	5
5 19 HG	30	.005	11.33	95	11.338	9672	1	4	6	.057	.1	0	.4	0	0
6 16 HG	19	.002	11.99	110	11.994	6396	1	3	20	.077	.1	0	1.6	4	5
7 3 HG	7	.002	15.12	230	15.123	18688	1	6	94	.113	.1	1	10.7	54	72
8 16 HG	8	.002	11.67	115	11.673	6396	0	3	21	.077	.0	0	1.6	4	5
9 C.T.		.002	1.11	20	1.113	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											.1	0	3.5		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)----------											.1	0	9.2		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 9)----------											.1	0	3.5		

FOUR CYCLE COMPOSITE -

HC- FID 0.35(.1) + 0.65(.1) = .066 G/ KW HR (.049 BS)

CO- NDIR 0.35(.9) + 0.65(.9) = .381 G/ KW HR (.289 BS)

NO2-CL 0.35(9.2) + 0.65(3.5) = 3.755 G/ KW HR (2.800 BS)

CORRECTED NO2 = 2.782 G/ KW HR (2.074 BS)

SFC = .565 KG/ KW HR (.928 BS)

TABLE D-5. MASS EMISSIONS BY NINE-MODE FTP -METRIC UNITS

ENGINE-20 TEST-2 RUN-3 EMIS. CONT. SYS. W CAT C-60 12-22-77 K = .766 NUM = 3.1 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOx-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NO2	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NO2-CL	KW	HP
1 IDLE	19	.002	8.77	90	8.779	1997	0	1	2	.232	.1	0	.5	0	0
2 16 HG	93	.002	10.88	85	10.887	6260	2	3	16	.077	.2	0	1.2	9	5
3 10 HG	9	.002	12.73	955	12.733	10529	0	9	125	.197	.1	1	18.9	26	35
9 16 HG	13	.002	11.33	105	11.339	6260	1	3	19	.077	.1	0	1.5	9	5
5 19 HG	21	.002	11.21	35	11.219	9581	1	2	5	.057	.0	0	.3	0	0
6 16 HG	19	.002	11.21	95	11.219	6260	1	3	18	.077	.1	0	1.9	9	5
7 3 HG	3	.002	19.99	520	19.993	18552	0	6	219	.113	.0	1	29.1	59	72
8 16 HG	3	.002	11.56	100	11.563	6260	0	3	18	.077	.0	0	1.9	9	5
9 C.T.		.002	.80	5	.803	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											.0	0	9.9		
1 IDLE	13	.002	8.77	35	8.779	1997	0	1	2	.232	.1	0	.5	0	0
2 16 HG	57	.002	10.88	80	10.888	6260	3	3	15	.077	.3	0	1.2	9	5
3 10 HG	9	.002	12.73	990	12.733	10529	1	9	139	.197	.1	1	19.8	26	35
9 16 HG	19	.002	11.21	100	11.219	6260	1	3	19	.077	.1	0	1.9	9	5
5 19 HG	28	.002	11.10	35	11.105	9581	1	2	5	.057	.1	0	.3	0	0
6 16 HG	20	.002	11.10	90	11.109	6260	1	3	17	.077	.1	0	1.3	9	5
7 3 HG	6	.002	19.99	980	19.993	18552	1	6	197	.113	.1	1	22.3	59	72
8 16 HG	7	.002	11.99	100	11.993	6260	0	3	18	.077	.0	0	1.9	9	5
9 C.T.		.002	.89	5	.893	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											.1	0	9.3		
1 IDLE	19	.002	8.67	35	8.679	1997	0	1	2	.232	.1	0	.5	0	0
2 16 HG	59	.002	10.88	80	10.888	6260	3	3	15	.077	.3	0	1.2	9	5
3 10 HG	11	.002	12.73	985	12.733	10529	1	9	133	.197	.1	1	19.6	26	35
9 16 HG	29	.002	11.33	100	11.339	6260	1	3	18	.077	.1	0	1.9	9	5
5 19 HG	90	.002	11.10	35	11.104	9581	2	2	5	.057	.1	0	.3	0	0
6 16 HG	21	.002	11.10	95	11.109	6260	1	3	18	.077	.1	0	1.9	9	5
7 3 HG	6	.002	19.99	960	19.993	18552	1	6	189	.113	.1	1	21.9	59	72
8 16 HG	9	.002	11.99	100	11.993	6260	0	3	18	.077	.0	0	1.9	9	5
9 C.T.		.002	.93	5	.933	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											.1	0	9.2		
1 IDLE	13	.002	8.67	35	8.679	1997	0	1	2	.232	.1	0	.5	0	0
2 16 HG	57	.002	10.88	80	10.888	6260	3	3	15	.077	.3	0	1.2	9	5
3 10 HG	9	.002	12.61	985	12.613	10529	1	9	139	.197	.1	1	19.7	26	35
9 16 HG	19	.002	11.10	95	11.109	6260	1	3	18	.077	.1	0	1.9	9	5
5 19 HG	31	.002	10.88	30	10.885	9581	1	2	9	.057	.1	0	.2	0	0
6 16 HG	20	.002	11.21	95	11.219	6260	1	3	18	.077	.1	0	1.9	9	5
7 3 HG	5	.002	19.99	995	19.993	18552	1	6	203	.113	.1	1	23.0	59	72
8 16 HG	21	.002	11.99	105	11.999	6260	1	3	19	.077	.1	0	1.5	9	5
9 C.T.		.002	.93	5	.933	0	0	0	0	.193	0.0	0	0.0	0	0
----------CYCLE COMPOSITE IN G / KW HR----------											.1	0	9.9		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)----------											.1	0	9.9		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 9)----------											.1	0	9.3		

FOUR CYCLE COMPOSITE -

HC- FID 0.35(.1) + 0.65(.1) = .069 G/ KW HR (.052 BS)

CO- NDIR 0.35(.2) + 0.65(.2) = .209 G/ KW HR (.156 BS)

NO2-CL 0.35(9.9) + 0.65(9.3) = 9.338 G/ KW HR (3.235 BS)

CORRECTED NO2 = 3.322 G/ KW HR (2.477 BS)

SFC = .557 KG/ KW HR (.916 BS)

TABLE D-6. MASS EMISSIONS BY NINE-MODE FTP -METRIC UNITS

ENGINE-20 TEST-9 RUN-1 BASELINE ENGINE C-60 02-02-78 K = .937 HUM = 8.2 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NO2	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NO2-CL	RA	MP
1 IDLE	5678	.181	11.61	60	12.359	1905	88	56	3	.232	20.3	13	.7	0	0
2 16 MG	352	.181	13.78	535	13.996	8800	22	230	112	.077	1.7	18	8.6	13	18
3 10 MG	899	.583	14.08	1437	14.253	13926	86	1112	513	.147	12.5	163	75.9	32	99
4 16 MG	308	.263	14.08	675	14.374	8800	19	325	137	.077	1.5	25	10.6	13	18
5 19 MG	72	.093	13.21	195	13.310	6219	3	88	30	.057	.2	5	1.7	0	0
6 16 MG	226	.215	13.93	610	14.168	8800	19	270	126	.077	1.1	21	9.7	13	18
7 3 MG	816	.511	13.93	2265	14.523	19051	107	1359	986	.113	12.1	153	111.5	60	81
8 16 MG	308	.376	14.08	711	14.486	8800	19	961	143	.077	1.4	35	11.0	13	18
9 C.T.	29291	.389	10.19	95	13.003	1950	369	118	2	.143	52.0	17	.3	0	0
----------CYCLE COMPOSITE IN G / KM HR----------											6.3	28	14.1		
1 IDLE	3993	.284	12.12	70	12.723	1905	60	62	3	.232	13.9	14	.8	0	0
2 16 MG	579	.312	13.93	590	14.300	8800	36	388	121	.077	2.7	30	9.3	13	18
3 10 MG	908	.569	14.08	1680	14.739	13926	86	1085	527	.147	12.6	160	77.5	32	99
4 16 MG	344	.275	14.08	650	14.390	8800	21	340	132	.077	1.6	26	10.2	13	18
5 19 MG	81	.088	13.21	190	13.306	6219	4	83	29	.057	.2	5	1.7	0	0
6 16 MG	272	.243	14.08	630	14.370	8800	17	325	128	.077	1.3	25	9.9	13	18
7 3 MG	707	.902	13.93	2283	14.902	19051	93	1073	1003	.113	10.6	121	113.3	60	81
8 16 MG	272	.337	14.08	700	14.494	8800	17	915	142	.077	1.3	32	10.9	13	18
9 C.T.	22825	.337	10.19	90	12.810	1950	397	109	2	.143	56.7	15	.3	0	0
----------CYCLE COMPOSITE IN G / KM HR----------											6.7	26	14.3		
1 IDLE	4268	.187	11.86	65	12.479	1905	65	58	3	.232	15.1	13	.8	0	0
2 16 MG	543	.337	13.93	630	14.321	8800	33	418	129	.077	2.6	32	9.9	13	18
3 10 MG	908	.590	14.08	1734	14.710	13926	86	1032	545	.147	12.6	152	80.1	32	99
4 16 MG	336	.275	14.08	680	14.399	8800	21	340	138	.077	2.0	26	10.6	13	18
5 19 MG	81	.093	13.21	195	13.311	6219	4	88	30	.057	.2	5	1.7	0	0
6 16 MG	272	.234	14.08	640	14.396	8800	17	296	130	.077	1.3	23	10.0	13	18
7 3 MG	780	.509	13.93	2310	14.512	19051	102	1336	1007	.113	11.6	151	113.8	60	81
8 16 MG	272	.337	13.93	675	14.294	8800	17	919	138	.077	1.3	32	10.6	13	18
9 C.T.	22807	.363	10.07	95	12.713	1950	350	112	2	.143	50.0	16	.3	0	0
----------CYCLE COMPOSITE IN G / KM HR----------											5.9	28	14.6		
1 IDLE	4126	.193	11.86	70	12.465	1905	63	59	4	.232	14.6	14	.8	0	0
2 16 MG	580	.902	13.93	615	14.340	8800	35	996	125	.077	2.7	38	9.6	13	18
3 10 MG	909	.583	14.08	1739	14.759	13926	86	1112	543	.147	12.6	163	79.9	32	99
4 16 MG	343	.312	14.08	690	14.428	8800	22	384	140	.077	1.7	30	10.8	13	18
5 19 MG	72	.088	13.21	190	13.305	6219	3	83	29	.057	.2	5	1.7	0	0
6 16 MG	308	.263	13.93	625	14.224	8800	19	329	139	.077	1.5	25	10.7	13	18
7 3 MG	735	.928	14.08	2356	14.582	19051	96	1130	1022	.113	10.9	128	115.5	60	81
8 16 MG	399	.363	14.08	730	14.983	8800	24	995	147	.077	1.9	39	11.3	13	18
9 C.T.	22805	.350	10.07	90	12.700	1950	350	108	3	.143	50.1	16	.9	0	0
----------CYCLE COMPOSITE IN G / KM HR----------											5.9	28	14.7		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)----------											6.0	27	14.6		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)----------											5.9	28	14.6		

FOUR CYCLE COMPOSITE -

HC- FID 0.35(6.0) + 0.65(5.9) = 5.945 G/ KM HR (9.933 BS)

CO- NDIR 0.45(26.9) + 0.55(27.7) = 27.385 G/ KM HR (20.921 BS)

NO2-CL 0.35(19.2) + 0.65(19.6) = 19.487 G/ KM HR (10.803 BS)

CORRECTED NO2 = 19.571 G/ KM HR (10.120 BS)

SFC = .484 KG/ KM HR (.804 BS)

TABLE D-7. MASS EMISSIONS BY NINE-MODE FTP -METRIC UNITS

ENGINE-20 TEST-9 RUN-2 BASELINE ENGINE C-60 02-03-78 K = .887 HUM = 6.5 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NO2	WT. FACT.	WEIGHTED G/HR HC-FID	CO	NO2-CL	KW	HP
1 IDLE	9419	.170	11.00	55	11,911	1973	123	57	3	.232	28.5	13	.7	0	0
2 16 HG	915	.197	13.64	595	13,829	9026	27	194	118	.077	2.1	15	9.1	13	18
3 10 HG	852	.969	13.93	1648	19,984	19152	83	926	535	.197	12.2	136	78.6	37	49
4 16 HG	289	.215	13.93	670	19,179	9026	18	277	192	.077	1.4	21	10.9	13	18
5 19 HG	63	.115	13.07	200	13,191	6282	3	110	32	.057	.2	6	1.8	0	0
6 16 HG	817	.851	13.64	615	13,913	9026	14	329	132	.077	1.1	25	10.2	13	18
7 3 HG	779	.969	13.78	2288	19,327	19187	104	1269	1017	.113	11.8	143	115.0	60	81
8 16 HG	262	.233	13.93	786	19,190	9026	17	300	166	.077	1.3	23	12.8	13	18
9 C.T.	86251	.389	9.35	90	12,769	2019	915	124	2	.193	54.4	18	.3	0	0
----------CYCLE COMPOSITE IN G / KW HR----------															
1 IDLE	5112	.210	11.61	65	12,331	1973	82	68	3	.232	7.2	25	19.7		
2 16 HG	933	.215	13.64	608	13,899	9026	28	282	130	.077	14.0	16	.8	0	0
3 10 HG	826	.928	13.93	1764	19,991	19152	81	848	574	.197	2.2	22	10.0	13	18
4 16 HG	253	.181	13.78	685	13,986	9026	16	236	147	.077	11.9	125	89.9	37	49
5 19 HG	72	.082	12.93	200	13,019	6282	3	80	32	.057	1.3	18	11.3	13	18
6 16 HG	217	.170	13.78	450	13,972	9026	19	222	139	.077	.2	5	1.8	0	0
7 3 HG	640	.363	13.64	2310	19,069	19187	90	999	1096	.113	1.1	17	10.7	13	18
8 16 HG	253	.251	13.93	790	19,206	9026	16	322	156	.077	10.2	113	118.2	60	81
9 C.T.	85548	.376	9.35	95	12,680	2019	907	121	2	.193	1.2	25	12.0	13	18
----------CYCLE COMPOSITE IN G / KW HR----------											58.2	17	.3	0	0
1 IDLE	8484	.187	11.61	70	12,045	1973	91	62	4	.232	6.4	22	16.3		
2 16 HG	488	.251	13.64	628	13,990	9026	32	328	134	.077	9.4	14	.9	0	0
3 10 HG	816	.955	13.93	1755	19,967	19152	80	900	570	.197	2.4	25	10.3	13	18
4 16 HG	271	.251	13.78	674	19,058	9026	17	326	144	.077	11.7	132	83.8	37	49
5 19 HG	90	.104	12.93	205	13,093	6282	4	101	33	.057	1.3	25	11.1	13	18
6 16 HG	224	.215	13.78	640	19,018	9026	15	280	137	.077	.2	6	1.9	0	0
7 3 HG	669	.389	13.64	2356	19,095	19187	91	1069	1065	.113	1.1	22	10.5	13	18
8 16 HG	262	.263	13.93	795	19,219	9026	17	337	157	.077	10.3	121	120.3	60	81
9 C.T.	23111	.331	9.86	50	12,502	2019	373	108	3	.193	1.3	24	12.1	13	18
----------CYCLE COMPOSITE IN G / KW HR----------											53.9	15	.9	0	0
1 IDLE	9268	.193	11.86	70	12,979	1973	67	62	4	.232	5.6	24	18.4		
2 16 HG	488	.257	13.78	640	14,086	9026	31	333	136	.077	15.7	14	.9	0	0
3 10 HG	898	.997	13.93	1749	19,917	19152	88	939	582	.197	2.9	26	10.5	13	18
4 16 HG	307	.275	13.78	690	19,086	9026	20	356	147	.077	12.9	144	85.5	37	49
5 19 HG	92	.072	12.93	210	13,009	6282	3	70	34	.057	1.5	27	11.3	13	18
6 16 HG	271	.227	13.78	650	19,035	9026	17	295	139	.077	.2	4	1.9	0	0
7 3 HG	750	.992	13.64	2378	19,157	19187	102	1210	1070	.113	1.3	23	10.7	13	18
8 16 HG	308	.337	13.78	773	19,198	9026	20	434	164	.077	11.5	137	120.9	60	81
9 C.T.	22962	.337	9.86	50	12,493	2019	368	110	3	.193	1.5	33	12.6	13	18
----------CYCLE COMPOSITE IN G / KW HR----------											52.7	16	.9	0	0
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 1 AND 2)----------											6.1	24	15.6		
AVERAGE SUM---(COMPOSITE VALUES FOR CYCLES 3 AND 4)----------											6.8	23	15.0		
FOUR CYCLE COMPOSITE -											5.8	25	15.5		

HC- FID 0.35(6.8) + 0.65(5.8) = 6.190 G/ KW HR (9.616 BS)

CO- NDIR 0.35(23.2) + 0.65(24.8) = 24.251 G/ KW HR (18.089 BS)

NO2-CL 0.35(15.8) + 0.65(15.5) = 15.308 G/ KW HR (11.415 BS)

CORRECTED NO2 = 13.573 G/ KW HR (10.122 BS)

SFC = .448 KG/ KW HR (.819 BS)

TABLE D-8. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 12/21/77
MODEL 1975 CHEV C-60 ECS
DRIVER KN
WET BULB TEMP 11 C
SPEC. HUM. 1.9 GRAM/KG
DISTANCE

TIME -0 HRS.
9-FTP RUN-2
TEST WT. 0 KG.
DRY BULB TEMP 26 C
BARO. 751.3 MM HG.
FUEL 738.2 G/LITRE

TEST NO. 1
ENGINE 5.7 LITREV 8
GVW 0 KG
REL. HUM. 6.9 PCT
MEASURED FUEL 0.00 KG
FUEL MC RATIO 1.860

RUN DURATION 20.00 MINUTES
BLOWER INLET PRESS. 393.7 MM. H2O
BLOWER DIF. PRESS. 495.3 MM H2O
BLOWER INLET TEMP. 96 DEG. C
DYNO REVOLUTIONS
BLOWER REVOLUTIONS 22969
BLOWER CU. CM /REV. 16948

BAG RESULTS

HC SAMPLE METER READING/SCALE	79.1/ 2
HC SAMPLE PPM	79
HC BACKGRD METER READING/SCALE	7.6/ 2
HC BACKGRD PPM	8
CO SAMPLE METER READING/SCALE	63.8/11
CO SAMPLE PPM	261
CO BACKGRD METER READING/SCALE	.8/11
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	60.8/ 3
CO2 SAMPLE PERCENT	1.08
CO2 BACKGRD METER READING/SCALE	3.6/ 3
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	30.7/ 2
NOX SAMPLE PPM	30.7
NOX BACKGRD METER READING/SCALE	.9/ 2
NOX BACKGRD PPM	.9
HC CONCENTRATION PPM	67
CO CONCENTRATION PPM	253
CO2 CONCENTRATION PCT	1.03
NOX CONCENTRATION PPM	30.3
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	12.86
CO MASS (GRAMS)	97.96
CO2 MASS (GRAMS)	6256.36
NOX MASS (GRAMS)	14.77
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)
CO GRAMS/KM (GRAMS/MILE)
CO2 GRAMS/KM (GRAMS/MILE)
NOX GRAMS/KM (GRAMS/MILE)
SO2 GRAMS/KM (GRAMS/MILE)

HC GRAMS/KG OF FUEL	6.32	HC GRAMS/MIN	.64
CO GRAMS/KG OF FUEL	48.1	CO GRAMS/MIN	4.9
CO2 GRAMS/KG OF FUEL	3074	CO2 GRAMS/MIN	313
NOX GRAMS/KG OF FUEL	7.26	NOX GRAMS/MIN	.74
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL 101.8 GRAMS/MIN

TOTAL CVS FLOWS 332.5570. CU. METRES

TABLE D-9. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 12/21/77	TIME -0 HRS.	TEST NO. 1
MODEL 1975 CHEV C-60 ECS	9-FTP RUN-3	ENGINE 5.7 LITREV 8
DRIVER KN	TEST WT. 0 KG.	GVW 0 KG
WET BULB TEMP 6 C	DRY BULB TEMP 22 C	REL. HUM. -7.5 PCT
SPEC. HUM. 1.2 GRAM/KG	BARO. 750.6 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	20.00 MINUTES
BLOWER INLET PRESS.	381.0 MM. H20
BLOWER DIF. PRESS.	982.6 MM H20
BLOWER INLET TEMP.	96 DEG. C
DYNO REVOLUTIONS	
BLOWER REVOLUTIONS	22969
BLOWER CU. CM /REV.	16957

BAG RESULTS

HC SAMPLE METER READING/SCALE	79.9/ 2
HC SAMPLE PPM	79
HC BACKGRD METER READING/SCALE	8.1/ 2
HC BACKGRD PPM	8
CO SAMPLE METER READING/SCALE	69.0/11
CO SAMPLE PPM	263
CO BACKGRD METER READING/SCALE	.8/11
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	59.7/ 3
CO2 SAMPLE PERCENT	1.06
CO2 BACKGRD METER READING/SCALE	3.2/ 3
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	31.1/ 2
NOX SAMPLE PPM	31.1
NOX BACKGRD METER READING/SCALE	.9/ 2
NOX BACKGRD PPM	.9
HC CONCENTRATION PPM	67
CO CONCENTRATION PPM	256
CO2 CONCENTRATION PCT	1.01
NOX CONCENTRATION PPM	30.7
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	12.89
CO MASS (GRAMS)	98.98
CO2 MASS (GRAMS)	6162.10
NOX MASS (GRAMS)	14.03
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)			
CO GRAMS/KM (GRAMS/MILE)			
CO2 GRAMS/KM (GRAMS/MILE)			
NOX GRAMS/KM (GRAMS/MILE)			
SO2 GRAMS/KM (GRAMS/MILE)			
HC GRAMS/KG OF FUEL	6.90	HC GRAMS/MIN	.69
CO GRAMS/KG OF FUEL	99.3	CO GRAMS/MIN	9.9
CO2 GRAMS/KG OF FUEL	3072	CO2 GRAMS/MIN	308
NOX GRAMS/KG OF FUEL	6.99	NOX GRAMS/MIN	.70
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL 100.3 GRAMS/MIN

TOTAL CVS FLOW= 332.8STD. CU. METRES

TABLE D-10. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 12/22/77 TIME -0 HRS. TEST NO. 2
MODEL 1976 CHEV C-60 ECSHC9-FIP RUN-2 ENGINE 5.7 LITREV 8
DRIVER KN TEST WT. 0 KG. GVW 0 KG
WET BULB TEMP 12 C DRY BULB TEMP 27 C REL. HUM. 13.1 PCT
SPEC. HUM. 2.9 GRAM/KG BARO. 747.3 MM HG. MEASURED FUEL 0.00 KG
DISTANCE FUEL 738.2 G/LITRE FUEL MC RATIO 1.860

RUN DURATION 20.00 MINUTES
BLOWER INLET PRESS. 378.5 MM. H20
BLOWER DIF. PRESS. 452.1 MM H20
BLOWER INLET TEMP. 96 DEG. C
DYNO REVOLUTIONS
BLOWER REVOLUTIONS 22492
BLOWER CU. CM /REV. 16978

BAG RESULTS

HC SAMPLE METER READING/SCALE	25.7/ 2
HC SAMPLE PPM	26
HC BACKGRD METER READING/SCALE	13.9/ 2
HC BACKGRD PPM	13
CO SAMPLE METER READING/SCALE	68.5/13
CO SAMPLE PPM	67
CO BACKGRD METER READING/SCALE	29.3/13
CO BACKGRD PPM	23
CO2 SAMPLE METER READING/SCALE	63.6/ 3
CO2 SAMPLE PERCENT	1.13
CO2 BACKGRD METER READING/SCALE	4.9/ 3
CO2 BACKGRD PERCENT	.08
NOX SAMPLE METER READING/SCALE	26.9/ 2
NOX SAMPLE PPM	26.9
NOX BACKGRD METER READING/SCALE	1.1/ 2
NOX BACKGRD PPM	1.1
HC CONCENTRATION PPM	13
CO CONCENTRATION PPM	99
CO2 CONCENTRATION PCT	1.07
NOX CONCENTRATION PPM	25.9
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	2.57
CO MASS (GRAMS)	17.06
CO2 MASS (GRAMS)	6978.92
NOX MASS (GRAMS)	13.07
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)
CO GRAMS/KM (GRAMS/MILE)
CO2 GRAMS/KM (GRAMS/MILE)
NOX GRAMS/KM (GRAMS/MILE)
SO2 GRAMS/KM (GRAMS/MILE)

HC GRAMS/KG OF FUEL	1.25	HC GRAMS/MIN	.13
CO GRAMS/KG OF FUEL	8.3	CO GRAMS/MIN	.9
CO2 GRAMS/KG OF FUEL	3152	CO2 GRAMS/MIN	324
NOX GRAMS/KG OF FUEL	6.36	NOX GRAMS/MIN	.65
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL 102.8 GRAMS/MIN

TOTAL CVS FLOW= 332.2SID. CU. METRES

TABLE D-11. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 12/22/77 TIME -0 HRS. TEST NO. 2
MODEL 1975 CHEV C-60 ECS#C9-FTP RUN-3 ENGINE 5.7 LITREV 8
DRIVER KN TEST WT. 0 KG. GVW 0 KG
WET BULB TEMP 12 C DRY BULB TEMP 27 C REL. HUM. 10.7 PCT
SPEC. HUM. 2.9 GRAM/KG BARO. 749.5 MM HG. MEASURED FUEL 0.00 KG
DISTANCE FUEL 738.2 G/LITRE FUEL MC RATIO 1.860

RUN DURATION	20.00 MINUTES
BLOWER INLET PRESS.	381.0 MM. H20
BLOWER DIF. PRESS.	936.9 MM H20
BLOWER INLET TEMP.	46 DEG. C
DYNO REVOLUTIONS	
BLOWER REVOLUTIONS	22525
BLOWER CU. CM /REV.	16989

BAG RESULTS

HC SAMPLE METER READING/SCALE	20.2/ 2
HC SAMPLE PPM	20
HC BACKGRD METER READING/SCALE	10.7/ 2
HC BACKGRD PPM	11
CO SAMPLE METER READING/SCALE	35.1/13
CO SAMPLE PPM	33
CO BACKGRD METER READING/SCALE	2.2/13
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	61.9/ 3
CO2 SAMPLE PERCENT	1.10
CO2 BACKGRD METER READING/SCALE	3.8/ 3
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	27.8/ 2
NOX SAMPLE PPM	27.8
NOX BACKGRD METER READING/SCALE	.9/ 2
NOX BACKGRD PPM	.9
HC CONCENTRATION PPM	10
CO CONCENTRATION PPM	30
CO2 CONCENTRATION PCT	1.05
NOX CONCENTRATION PPM	27.9
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	1.98
CO MASS (GRAMS)	11.73
CO2 MASS (GRAMS)	6352.81
NOX MASS (GRAMS)	13.63
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	
CO GRAMS/KM (GRAMS/MILE)	
CO2 GRAMS/KM (GRAMS/MILE)	
NOX GRAMS/KM (GRAMS/MILE)	
SO2 GRAMS/KM (GRAMS/MILE)	

HC GRAMS/KG OF FUEL	.99	HC GRAMS/MIN	.10
CO GRAMS/KG OF FUEL	5.8	CO GRAMS/MIN	.6
CO2 GRAMS/KG OF FUEL	3157	CO2 GRAMS/MIN	318
NOX GRAMS/KG OF FUEL	6.78	NOX GRAMS/MIN	.68
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL 100.7 GRAMS/MIN

TOTAL CVS FLOWS 331.5510. CU. METRES

TABLE D-12. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 28

DATE 8/ 8/79
MODEL 1975 CHEV C-[illegible] 8L
DRIVER KEN
WET BULB TEMP 17 C
SPEC. HUM. 8.7 GRAM/KG
DISTANCE

TIME -0 HRS.
8-FTP RUN-1
TEST WT. 7711 KG.
DRY BULB TEMP 29 C
BARO. 747.3 MM HG.
FUEL 736.2 G/LITRE

TEST NO. 4
ENGINE 5.7 LITER V 8
CVS 8 KG
REL. HUM. 44.4 PCT
MEASURED FUEL 0.00 KG
FUEL HC RATIO 1.860

RUN DURATION 20.00 MINUTES
BLOWER INLET PRESS. 999.5 MM. H20
BLOWER DIF. PRESS. 508.0 MM H20
BLOWER INLET TEMP. 43 DEG. C
DYNO REVOLUTIONS -0
BLOWER REVOLUTIONS 22179
BLOWER CU. CM /REV. 16909

BAG RESULTS

HC SAMPLE METER READING/SCALE	20.0/ 3
HC SAMPLE PPM	200
HC BACKGRD METER READING/SCALE	2.5/ 3
HC BACKGRD PPM	25
CO SAMPLE METER READING/SCALE	91.2/11
CO SAMPLE PPM	956
CO BACKGRD METER READING/SCALE	3.6/11
CO BACKGRD PPM	11
CO2 SAMPLE METER READING/SCALE	77.6/ 3
CO2 SAMPLE PERCENT	1.92
CO2 BACKGRD METER READING/SCALE	5.5/ 3
CO2 BACKGRD PERCENT	.08
NOX SAMPLE METER READING/SCALE	36.7/ 3
NOX SAMPLE PPM	110.1
NOX BACKGRD METER READING/SCALE	.3/ 3
NOX BACKGRD PPM	.9
HC CONCENTRATION PPM	178
CO CONCENTRATION PPM	927
CO2 CONCENTRATION PCT	1.84
NOX CONCENTRATION PPM	109.3
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	33.98
CO MASS (GRAMS)	162.31
CO2 MASS (GRAMS)	8041.80
NOX MASS (GRAMS)	69.02
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)
CO GRAMS/KM (GRAMS/MILE)
CO2 GRAMS/KM (GRAMS/MILE)
NOX GRAMS/KM (GRAMS/MILE)
SO2 GRAMS/KM (GRAMS/MILE)

HC GRAMS/KG OF FUEL	12.63	HC GRAMS/MIN	1.67
CO GRAMS/KG OF FUEL	61.2	CO GRAMS/MIN	8.1
CO2 GRAMS/KG OF FUEL	3033	CO2 GRAMS/MIN	402
NOX GRAMS/KG OF FUEL	24.15	NOX GRAMS/MIN	3.20
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL 131.2 GRAMS/MIN

TOTAL CVS FLOW 326.4STD. CU. METERS

TABLE D-13. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 8/ 3/78	TIME -0 HRS.	TEST NO. 9
MODEL 1975 CHEV C-60 8L	4-FTP RUN-2	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 19 C	DRY BULB TEMP 29 C	REL. HUM. 44.8 PCT
SPEC. HUM. 8.7 GRAM/KG	BARO. 749.6 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE	FUEL 738.2 G/LITRE	FUEL MC RATIO 1.860

RUN DURATION	20.00 MINUTES
BLOWER INLET PRESS.	699.5 MM. H20
BLOWER DIF. PRESS.	520.7 MM H20
BLOWER INLET TEMP.	43 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	22127
BLOWER CU. CM /REV.	16899

BAG RESULTS

HC	SAMPLE METER READING/SCALE	19.7/ 3
HC	SAMPLE PPM	197
HC	BACKGRD METER READING/SCALE	2.4/ 3
HC	BACKGRD PPM	24
CO	SAMPLE METER READING/SCALE	86.9/11
CO	SAMPLE PPM	415
CO	BACKGRD METER READING/SCALE	1.3/11
CO	BACKGRD PPM	6
CO2	SAMPLE METER READING/SCALE	77.6/ 3
CO2	SAMPLE PERCENT	1.92
CO2	BACKGRD METER READING/SCALE	9.3/ 3
CO2	BACKGRD PERCENT	.09
NOX	SAMPLE METER READING/SCALE	36.2/ 3
NOX	SAMPLE PPM	108.6
NOX	BACKGRD METER READING/SCALE	.3/ 3
NOX	BACKGRD PPM	.9
HC	CONCENTRATION PPM	176
CO	CONCENTRATION PPM	394
CO2	CONCENTRATION PCT	1.84
NOX	CONCENTRATION PPM	107.8
SO2	CONCENTRATION PPM	0.0
HC	MASS (GRAMS)	33.10
CO	MASS (GRAMS)	149.88
CO2	MASS (GRAMS)	8143.79
NOX	MASS (GRAMS)	63.09
SO2	MASS (GRAMS)	0.00

HC	GRAMS/KM (GRAMS/MILE)		
CO	GRAMS/KM (GRAMS/MILE)		
CO2	GRAMS/KM (GRAMS/MILE)		
NOX	GRAMS/KM (GRAMS/MILE)		
SO2	GRAMS/KM (GRAMS/MILE)		
HC	GRAMS/KG OF FUEL 12.36	HC GRAMS/MIN	1.65
CO	GRAMS/KG OF FUEL 56.0	CO GRAMS/MIN	7.5
CO2	GRAMS/KG OF FUEL 3042	CO2 GRAMS/MIN	407
NOX	GRAMS/KG OF FUEL 23.57	NOX GRAMS/MIN	3.15
SO2	GRAMS/KG OF FUEL 0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL 133.6 GRAMS/MIN

TOTAL CVS FLOW 326.9STD. CU. METRES

APPENDIX E

CHASSIS DYNAMOMETER TRANSIENT TEST RESULTS - STANDARD CONFIGURATION

TABLES E-1 & E-2	Summary of the Results
TABLES E-3 through E-10	CAPE-21C - Run 1
TABLES E-11 through E-18	CAPE-21C - Run 2
TABLES E-19 through E-22	CAPE-21H - Run 1
TABLES E-23 through E-26	CAPE-21H - Run 2
TABLES E-27 through E-28	Light-Duty FTP

TABLE E-1. CHASSIS DYNAMOMETER TRANSIENT EVALUATIONS WITH THE STANDARD CONFIGURATION-G/KM

Test	Cycle	Bag	Emissions, g/km				Fuel	Emissions, g/km				Fuel
			HC	CO	NO_x	CO_2	ℓ/100km	HC	CO	NO_x	CO_2	ℓ/100km
CAPE-21C	LA-NF	1	24.33	215.25	4.46	978	59.47	26.06	217.09	4.94	924	57.52
	LA-F	2	2.75	88.31	7.11	871	43.48	3.59	126.07	7.64	860	45.64
	LA-NF	3	7.05	70.23	5.22	828	41.01	8.22	90.94	5.28	775	40.28
	LA-F	4	2.57	91.47	6.75	884	44.21	3.17	120.88	7.47	845	44.60
	NY-NF	5	12.78	116.55	5.61	1146	58.45	14.10	131.99	6.26	1059	55.96
	NY-F	6	5.49	112.24	4.84	760	40.73	5.20	130.34	5.67	748	41.36
	LA-NF	7	10.28	66.50	5.36	832	41.35	11.91	87.89	6.46	852	43.87
	LA-F	8	2.48	85.19	7.68	925	45.51	3.10	104.77	8.69	852	43.79
CAPE-21H	LA-NF	1	12.65	78.13	5.49	876	44.36	12.57	85.08	5.10	843	43.40
	LA-F	2	2.75	95.82	6.93	860	43.51	2.94	101.57	6.78	848	43.39
	NY-NF	3	15.14	128.56	5.56	1112	58.14	16.01	129.27	5.21	1042	55.31
	NY-F	4	5.83	116.10	4.90	723	39.41	5.66	115.92	4.65	708	38.74
LD-FTP	505C	1	11.77	188.01	5.60	920	53.47	13.59	208.53	5.58	947	56.25
	867S	2	7.62	69.12	6.84	959	46.61	7.97	84.49	5.96	925	46.23
	505H	3	7.78	148.03	6.48	848	47.19	8.48	163.90	5.96	829	47.53
	TOTAL		8.51	114.83	6.49	921	48.17	9.25	131.39	5.88	904	48.63

TABLE E-2. CHASSIS DYNAMOMETER TRANSIENT EVALUATIONS WITH THE STANDARD CONFIGURATION-G/MIN

Test	Cycle	Bag	Emissions, g/min				Fuel g/min	Emissions, g/min				Fuel g/min
			HC	CO	NO_x	CO_2		HC	CO	NO_x	CO_2	
CAPE-21C	LA-NF	1	9.39	83.1	1.72	377	169.4	10.02	83.5	1.90	355	163.4
	LA-F	2	3.29	105.7	8.51	1043	384.7	4.33	152.2	9.23	1038	407.2
	LA-NF	3	2.76	27.5	2.04	324	118.6	3.17	35.1	2.04	299	114.9
	LA-F	4	3.08	109.7	8.10	1060	391.9	3.74	142.4	8.80	996	388.6
	NY-NF	5	2.58	23.5	1.13	231	87.1	2.99	28.0	1.33	225	87.9
	NY-F	6	4.00	81.8	3.53	554	219.3	3.78	94.8	4.13	544	222.4
	LA-NF	7	4.01	25.9	2.09	324	119.1	4.68	34.5	2.54	335	127.5
	LA-F	8	3.02	103.6	9.34	1124	409.0	3.77	127.3	10.57	1035	393.4
CAPE-21H	LA-NF	1	4.97	30.7	2.16	345	129.1	5.01	33.9	2.03	336	127.8
	LA-F	2	3.33	115.9	8.38	1040	388.9	3.58	123.5	8.25	1031	390.1
	NY-NF	3	3.10	26.3	1.14	228	88.1	3.23	26.1	1.05	210	82.4
	NY-F	4	4.23	84.3	3.56	525	211.7	4.04	82.8	3.32	505	204.4
LD-FTP	505C	1	7.76	124.0	3.69	607	260.4	7.84	125.2	3.73	613	268.8
	867S	2	3.27	29.6	2.93	411	147.5	3.30	29.93	2.96	415	153.1
	505H	3	5.20	99.0	4.33	567	232.9	5.25	99.9	4.38	573	242.5
	TOTAL		4.39	59.3	3.35	476	183.8	4.44	59.9	3.38	480	190.6

TABLE E-3. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/26/78	TIME -0 HRS.	TEST NO. 10
MODEL 1975 CHEV C-60 BL	RUN=1 BAG=1 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 11 C	DRY BULB TEMP 24 C	REL. HUM. 14.2 PCT
SPEC. HUM. 2.7 GRAM/KG	BARO. 745.0 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 1.850 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.79 MINUTES
BLOWER INLET PRESS.	457.2 MM. H20
BLOWER DIF. PRESS.	490.2 MM H20
BLOWER INLET TEMP.	26 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5485
BLOWER CU. CM /REV.	16698

BAG RESULTS	
HC SAMPLE METER READING/SCALE	95.4/ 3
HC SAMPLE PPM	954
HC BACKGRD METER READING/SCALE	2.6/ 3
HC BACKGRD PPM	26
CO SAMPLE METER READING/SCALE	75.2/ 2
CO SAMPLE PPM	4206
CO BACKGRD METER READING/SCALE	.2/ 2
CO BACKGRD PPM	8
CO2 SAMPLE METER READING/SCALE	68.1/ 3
CO2 SAMPLE PERCENT	1.23
CO2 BACKGRD METER READING/SCALE	3.5/ 3
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	65.3/ 2
NOX SAMPLE PPM	65.3
NOX BACKGRD METER READING/SCALE	.4/ 2
NOX BACKGRD PPM	.4
HC CONCENTRATION PPM	931
CO CONCENTRATION PPM	4081
CO2 CONCENTRATION PCT	1.18
NOX CONCENTRATION PPM	65.0
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	45.02
CO MASS (GRAMS)	398.28
CO2 MASS (GRAMS)	1809.36
NOX MASS (GRAMS)	8.25
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	24.33	(39.15)
CO GRAMS/KM (GRAMS/MILE)	215.25	(346.33)
CO2 GRAMS/KM (GRAMS/MILE)	978	(1573)
NOX GRAMS/KM (GRAMS/MILE)	4.46	(7.17)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	55.35	HC GRAMS/MIN	9.39
CO GRAMS/KG OF FUEL	489.7	CO GRAMS/MIN	83.1
CO2 GRAMS/KG OF FUEL	2225	CO2 GRAMS/MIN	377
NOX GRAMS/KG OF FUEL	10.14	NOX GRAMS/MIN	1.72
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 59.47 (3.96)

TOTAL CVS FLOW= 83.9STD. CU. METRES

TABLE E-4. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/26/78	TIME =0 HRS.	TEST NO. 10
MODEL 1975 CHEV C-60 8L	RUN=1 BAG=2 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 11 C	DRY BULB TEMP 24 C	REL. HUM. 19.2 PCT
SPEC. HUM. 2.7 GRAM/KG	BARO. 745.0 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 5.374 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	9.99 MINUTES
BLOWER INLET PRESS.	510.5 MM. H20
BLOWER DIF. PRESS.	541.0 MM H20
BLOWER INLET TEMP.	65 DEG. C
DYNO REVOLUTIONS	=0
BLOWER REVOLUTIONS	5026
BLOWER CU. CM /REV.	16909

BAG RESULTS

HC SAMPLE METER READING/SCALE	39.8/ 3
HC SAMPLE PPM	398
HC BACKGRD METER READING/SCALE	3.5/ 3
HC BACKGRD PPM	35
CO SAMPLE METER READING/SCALE	65.1/ 1
CO SAMPLE PPM	6459
CO BACKGRD METER READING/SCALE	.2/ 1
CO BACKGRD PPM	11
CO2 SAMPLE METER READING/SCALE	73.9/ 2
CO2 SAMPLE PERCENT	3.77
CO2 BACKGRD METER READING/SCALE	1.6/ 2
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	36.9/ 4
NOX SAMPLE PPM	369.0
NOX BACKGRD METER READING/SCALE	.1/ 4
NOX BACKGRD PPM	1.0
HC CONCENTRATION PPM	375
CO CONCENTRATION PPM	5953
CO2 CONCENTRATION PCT	3.73
NOX CONCENTRATION PPM	368.3
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	14.79
CO MASS (GRAMS)	474.58
CO2 MASS (GRAMS)	4681.65
NOX MASS (GRAMS)	38.21
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	2.75 (4.43)
CO GRAMS/KM (GRAMS/MILE)	88.31 (142.09)
CO2 GRAMS/KM (GRAMS/MILE)	871 (1402)
NOX GRAMS/KM (GRAMS/MILE)	7.11 (11.44)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)

HC GRAMS/KG OF FUEL	8.56	HC GRAMS/MIN	3.29
CO GRAMS/KG OF FUEL	274.8	CO GRAMS/MIN	105.7
CO2 GRAMS/KG OF FUEL	2711	CO2 GRAMS/MIN	1043
NOX GRAMS/KG OF FUEL	22.12	NOX GRAMS/MIN	8.51
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 43.48 (5.41)

TOTAL CVS FLOW= 68.5STD. CU. METRES

TABLE E-5. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/26/78	TIME -0 HRS.	TEST NO. 10
MODEL 1975 CHEV C-60 8L	RUN-1 BAG-3 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 11 C	DRY BULB TEMP 24 C	REL. HUM. 14.2 PCT
SPEC. HUM. 2.7 GRAM/KG	BARO. 745.0 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 1.866 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	9.76 MINUTES
BLOWER INLET PRESS.	936.9 MM. H20
BLOWER DIF. PRESS.	969.8 MM H20
BLOWER INLET TEMP.	62 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5369
BLOWER CU. CM /REV.	16985

BAG RESULTS

HC SAMPLE METER READING/SCALE	33.1/ 3
HC SAMPLE PPM	331
HC BACKGRD METER READING/SCALE	2.9/ 3
HC BACKGRD PPM	29
CO SAMPLE METER READING/SCALE	61.3/ 3
CO SAMPLE PPM	1550
CO BACKGRD METER READING/SCALE	.1/ 3
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	65.5/ 3
CO2 SAMPLE PERCENT	1.17
CO2 BACKGRD METER READING/SCALE	3.2/ 3
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	86.7/ 2
NOX SAMPLE PPM	86.7
NOX BACKGRD METER READING/SCALE	.8/ 2
NOX BACKGRD PPM	.8
HC CONCENTRATION PPM	305
CO CONCENTRATION PPM	1506
CO2 CONCENTRATION PCT	1.13
NOX CONCENTRATION PPM	86.0
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	13.15
CO MASS (GRAMS)	131.08
CO2 MASS (GRAMS)	1545.77
NOX MASS (GRAMS)	9.34
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	7.05 (11.34)		
CO GRAMS/KM (GRAMS/MILE)	70.23 (113.00)		
CO2 GRAMS/KM (GRAMS/MILE)	828 (1333)		
NOX GRAMS/KM (GRAMS/MILE)	5.22 (8.40)		
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)		
HC GRAMS/KG OF FUEL	23.24	HC GRAMS/MIN	2.76
CO GRAMS/KG OF FUEL	231.6	CO GRAMS/MIN	27.5
CO2 GRAMS/KG OF FUEL	2732	CO2 GRAMS/MIN	324
NOX GRAMS/KG OF FUEL	17.22	NOX GRAMS/MIN	2.04
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 41.01 (5.74)

TOTAL CVS FLOW= 79.8STD. CU. METRES

TABLE E-6. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/26/78	TIME -0 HRS.	TEST NO. 10
MODEL 1975 CHEV C-60 BL	RUN-1 BAG-1 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 11 C	DRY BULB TEMP 24 C	REL. HUM. 19.2 PCT
SPEC. HUM. 2.7 GRAM/KG	BARO. 745.0 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 5.390 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	9.99 MINUTES
BLOWER INLET PRESS.	669.9 MM. H20
BLOWER DIF. PRESS.	510.5 MM H20
BLOWER INLET TEMP.	73 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5099
BLOWER CU. CM /REV.	16926

BAG RESULTS

HC SAMPLE METER READING/SCALE	37.6/ 3
HC SAMPLE PPM	376
HC BACKGRD METER READING/SCALE	3.1/ 3
HC BACKGRD PPM	31
CO SAMPLE METER READING/SCALE	67.1/ 1
CO SAMPLE PPM	6816
CO BACKGRD METER READING/SCALE	.1/ 1
CO BACKGRD PPM	6
CO2 SAMPLE METER READING/SCALE	75.6/ 2
CO2 SAMPLE PERCENT	3.89
CO2 BACKGRD METER READING/SCALE	1.5/ 2
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	35.7/ 4
NOX SAMPLE PPM	357.0
NOX BACKGRD METER READING/SCALE	.2/ 4
NOX BACKGRD PPM	2.0
HC CONCENTRATION PPM	356
CO CONCENTRATION PPM	6270
CO2 CONCENTRATION PCT	3.85
NOX CONCENTRATION PPM	355.7
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	13.85
CO MASS (GRAMS)	493.01
CO2 MASS (GRAMS)	9769.73
NOX MASS (GRAMS)	36.39
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	2.57 (4.13)		
CO GRAMS/KM (GRAMS/MILE)	91.47 (147.17)		
CO2 GRAMS/KM (GRAMS/MILE)	884 (1422)		
NOX GRAMS/KM (GRAMS/MILE)	6.75 (10.86)		
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)		
HC GRAMS/KG OF FUEL	7.86	HC GRAMS/MIN	3.08
CO GRAMS/KG OF FUEL	279.9	CO GRAMS/MIN	104.7
CO2 GRAMS/KG OF FUEL	2705	CO2 GRAMS/MIN	1060
NOX GRAMS/KG OF FUEL	20.66	NOX GRAMS/MIN	8.10
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 44.21 (5.32)

TOTAL CVS FLOW= 67.6STD. CU. METRES

TABLE E-7. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/26/78	TIME -0 HRS.	TEST NO. 10
MODEL 1975 CHEV C-60 8L	RUN-1 BAG-S 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 11 C	DRY BULB TEMP 24 C	REL. HUM. 19.2 PCT
SPEC. HUM. 2.7 GRAM/KG	BARO. 745.0 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE .869 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	9.30 MINUTES
BLOWER INLET PRESS.	436.9 MM. H20
BLOWER DIF. PRESS.	469.9 MM H20
BLOWER INLET TEMP.	65 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	4848
BLOWER CU. CM /REV.	16971

BAG RESULTS	
HC SAMPLE METER READING/SCALE	31.6/ 3
HC SAMPLE PPM	316
HC BACKGRD METER READING/SCALE	3.0/ 3
HC BACKGRD PPM	30
CO SAMPLE METER READING/SCALE	53.9/ 3
CO SAMPLE PPM	1333
CO BACKGRD METER READING/SCALE	.1/ 3
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	50.9/ 3
CO2 SAMPLE PERCENT	.87
CO2 BACKGRD METER READING/SCALE	4.3/ 3
CO2 BACKGRD PERCENT	.07
NOX SAMPLE METER READING/SCALE	49.4/ 2
NOX SAMPLE PPM	99.4
NOX BACKGRD METER READING/SCALE	1.3/ 2
NOX BACKGRD PPM	1.3
HC CONCENTRATION PPM	288
CO CONCENTRATION PPM	1302
CO2 CONCENTRATION PCT	.81
NOX CONCENTRATION PPM	98.2
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	11.11
CO MASS (GRAMS)	101.27
CO2 MASS (GRAMS)	995.48
NOX MASS (GRAMS)	9.88
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	12.78 (20.57)		
CO GRAMS/KM (GRAMS/MILE)	116.55 (187.54)		
CO2 GRAMS/KM (GRAMS/MILE)	1146 (1843)		
NOX GRAMS/KM (GRAMS/MILE)	5.61 (9.03)		
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)		
HC GRAMS/KG OF FUEL	29.59	HC GRAMS/MIN	2.58
CO GRAMS/KG OF FUEL	269.8	CO GRAMS/MIN	23.5
CO2 GRAMS/KG OF FUEL	2652	CO2 GRAMS/MIN	231
NOX GRAMS/KG OF FUEL	13.00	NOX GRAMS/MIN	1.13
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 58.45 (4.02)

TOTAL CVS FLOW= 66.8STD. CU. METRES

TABLE E-8. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/26/78	TIME -0 HRS.	TEST NO. 10
MODEL 1975 CHEV C-60 BL	RUN-1 BAG-6 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 11 C	DRY BULB TEMP 24 C	REL. HUM. 14.2 PCT
SPEC. HUM. 2.7 GRAM/KG	BARO. 745.0 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 3.379 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.63 MINUTES
BLOWER INLET PRESS.	487.7 MM. H20
BLOWER DIF. PRESS.	515.6 MM H20
BLOWER INLET TEMP.	58 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5204
BLOWER CU. CM /REV.	16947

BAG RESULTS	
HC SAMPLE METER READING/SCALE	46.8/ 3
HC SAMPLE PPM	468
HC BACKGRD METER READING/SCALE	3.1/ 3
HC BACKGRD PPM	31
CO SAMPLE METER READING/SCALE	80.8/ 2
CO SAMPLE PPM	4686
CO BACKGRD METER READING/SCALE	.1/ 2
CO BACKGRD PPM	4
CO2 SAMPLE METER READING/SCALE	44.4/ 2
CO2 SAMPLE PERCENT	1.93
CO2 BACKGRD METER READING/SCALE	1.4/ 2
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	99.8/ 3
NOX SAMPLE PPM	149.4
NOX BACKGRD METER READING/SCALE	.3/ 3
NOX BACKGRD PPM	.4
HC CONCENTRATION PPM	443
CO CONCENTRATION PPM	4683
CO2 CONCENTRATION PCT	1.93
NOX CONCENTRATION PPM	148.7
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	18.55
CO MASS (GRAMS)	378.26
CO2 MASS (GRAMS)	2569.91
NOX MASS (GRAMS)	16.37
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	5.49	(8.83)
CO GRAMS/KM (GRAMS/MILE)	112.24	(180.60)
CO2 GRAMS/KM (GRAMS/MILE)	760	(1224)
NOX GRAMS/KM (GRAMS/MILE)	4.84	(7.79)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	18.23	HC GRAMS/MIN	4.00
CO GRAMS/KG OF FUEL	372.8	CO GRAMS/MIN	81.8
CO2 GRAMS/KG OF FUEL	2526	CO2 GRAMS/MIN	554
NOX GRAMS/KG OF FUEL	16.09	NOX GRAMS/MIN	3.53
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 40.73 (5.78)

TOTAL CVS FLOW= 72.7STD. CU. METRES

TABLE E-9. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/26/78	TIME -0 HRS.	TEST NO. 10
MODEL 1975 CHEV C-60 BL	RUN-1 BAG-? 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 11 C	DRY BULB TEMP 24 C	REL. HUM. 19.2 PCT
SPEC. HUM. 2.? GRAM/KG	BARO. 745.0 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 1.883 KM	FUEL 738.2 G/LITRE	FUEL WC RATIO 1.860

RUN DURATION	?.83 MINUTES
BLOWER INLET PRESS.	969.8 MM. H20
BLOWER DIF. PRESS.	502.? MM H20
BLOWER INLET TEMP.	28 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5398
BLOWER CU. CM /REV.	1670?

BAG RESULTS

HC	SAMPLE METER READING/SCALE	?2.7/ 3
HC	SAMPLE PPM	?27
HC	BACKGRD METER READING/SCALE	1.?/ 3
HC	BACKGRD PPM	1?
CO	SAMPLE METER READING/SCALE	5?.5/ 3
CO	SAMPLE PPM	1350
CO	BACKGRD METER READING/SCALE	.1/ 3
CO	BACKGRD PPM	2
CO2	SAMPLE METER READING/SCALE	61.5/ 3
CO2	SAMPLE PERCENT	1.0?
CO2	BACKGRD METER READING/SCALE	3.5/ 3
CO2	BACKGRD PERCENT	.05
NOX	SAMPLE METER READING/SCALE	81.8/ 2
NOX	SAMPLE PPM	81.8
NOX	BACKGRD METER READING/SCALE	.5/ 2
NOX	BACKGRD PPM	.5
HC	CONCENTRATION PPM	?10
CO	CONCENTRATION PPM	1313
CO2	CONCENTRATION PCT	1.0?
NOX	CONCENTRATION PPM	81.3
SO2	COCENTRATION PPM	0.0
HC	MASS (GRAMS)	1?.35
CO	MASS (GRAMS)	125.1?
CO2	MASS (GRAMS)	1565.5?
NOX	MASS (GRAMS)	10.0?
SO2	MASS (GRAMS)	0.00

HC	GRAMS/KM (GRAMS/MILE)	10.28 (16.5?)
CO	GRAMS/KM (GRAMS/MILE)	66.50 (107.00)
CO2	GRAMS/KM (GRAMS/MILE)	832 (1338)
NOX	GRAMS/KM (GRAMS/MILE)	5.36 (8.63)
SO2	GRAMS/KM (GRAMS/MILE)	0.00 (0.00)

HC	GRAMS/KG OF FUEL 33.63	HC	GRAMS/MIN ?.01
CO	GRAMS/KG OF FUEL 217.?	CO	GRAMS/MIN 25.?
CO2	GRAMS/KG OF FUEL 2721	CO2	GRAMS/MIN 32?
NOX	GRAMS/KG OF FUEL 17.??	NOX	GRAMS/MIN 2.0?
SO2	GRAMS/KG OF FUEL 0.00	SO2	GRAMS/MIN 0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) ?1.35 (5.6?)

TOTAL CVS FLOW= ?1.?STD. CU. METRES

TABLE E-10. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/26/78	TIME -0 HRS.	TEST NO. 10
MODEL 1975 CHEV C-60 BL	RUN-1 BAG-B 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 11 C	DRY BULB TEMP 24 C	REL. HUM. 14.2 PCT
SPEC. HUM. 2.7 GRAM/KG	BARO. 745.0 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 5.906 KM	FUEL 738.2 G/LITRE	FUEL MC RATIO 1.860

RUN DURATION	9.99	MINUTES
BLOWER INLET PRESS.	477.5	MM. H20
BLOWER DIF. PRESS.	513.1	MM H20
BLOWER INLET TEMP.	66	DEG. C
DYNO REVOLUTIONS	-0	
BLOWER REVOLUTIONS	6977	
BLOWER CU. CM /REV.	16930	

BAG RESULTS

HC SAMPLE METER READING/SCALE	36.1/ 3	
HC SAMPLE PPM	361	
HC BACKGRD METER READING/SCALE	2.8/ 3	
HC BACKGRD PPM	28	
CO SAMPLE METER READING/SCALE	69.5/ 1	
CO SAMPLE PPM	6955	
CO BACKGRD METER READING/SCALE	.1/ 1	
CO BACKGRD PPM	6	
CO2 SAMPLE METER READING/SCALE	78.1/ 2	
CO2 SAMPLE PERCENT	9.06	
CO2 BACKGRD METER READING/SCALE	1.8/ 2	
CO2 BACKGRD PERCENT	.07	
NOX SAMPLE METER READING/SCALE	40.5/ 4	
NOX SAMPLE PPM	405.0	
NOX BACKGRD METER READING/SCALE	.2/ 4	
NOX BACKGRD PPM	2.0	
HC CONCENTRATION PPM	343	
CO CONCENTRATION PPM	5825	
CO2 CONCENTRATION PCT	9.02	
NOX CONCENTRATION PPM	403.7	
SO2 COCENTRATION PPM	0.0	
HC MASS (GRAMS)	13.42	
CO MASS (GRAMS)	460.55	
CO2 MASS (GRAMS)	9998.34	
NOX MASS (GRAMS)	41.53	
SO2 MASS (GRAMS)	0.00	

HC GRAMS/KM (GRAMS/MILE)	2.48 (3.99)	
CO GRAMS/KM (GRAMS/MILE)	85.19 (137.09)	
CO2 GRAMS/KM (GRAMS/MILE)	925 (1488)	
NOX GRAMS/KM (GRAMS/MILE)	7.68 (12.36)	
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)	

HC GRAMS/KG OF FUEL	7.38	HC GRAMS/MIN	3.02
CO GRAMS/KG OF FUEL	253.2	CO GRAMS/MIN	103.6
CO2 GRAMS/KG OF FUEL	2748	CO2 GRAMS/MIN	1124
NOX GRAMS/KG OF FUEL	22.84	NOX GRAMS/MIN	9.34
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 45.51 (5.17)

TOTAL CVS FLOW 67.9STD. CU. METRES

TABLE E-11. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/30/78	TIME -0 HRS.	TEST NO. 10
MODEL 1975 CHEV C-60 BL	RUN-2 BAG-1 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 15 C	DRY BULB TEMP 18 C	REL. HUM. 70.3 PCT
SPEC. HUM. 9.4 GRAM/KG	BARO. 748.0 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 1.850 KM	FUEL 738.2 G/LITRE	FUEL MC RATIO 1.860

RUN DURATION	9.81 MINUTES
BLOWER INLET PRESS.	957.2 MM. H2O
BLOWER DIF. PRESS.	508.0 MM H2O
BLOWER INLET TEMP.	32 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5393
BLOWER CU. CM /REV.	16762

BAG RESULTS

HC SAMPLE METER READING/SCALE	10.6/ 9
HC SAMPLE PPM	1060
HC BACKGRD METER READING/SCALE	.9/ 9
HC BACKGRD PPM	90
CO SAMPLE METER READING/SCALE	78.0/ 2
CO SAMPLE PPM	4992
CO BACKGRD METER READING/SCALE	.3/ 2
CO BACKGRD PPM	11
CO2 SAMPLE METER READING/SCALE	66.8/ 3
CO2 SAMPLE PERCENT	1.20
CO2 BACKGRD METER READING/SCALE	9.1/ 3
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	61.9/ 2
NOX SAMPLE PPM	61.9
NOX BACKGRD METER READING/SCALE	.8/ 2
NOX BACKGRD PPM	.8
HC CONCENTRATION PPM	1025
CO CONCENTRATION PPM	4229
CO2 CONCENTRATION PCT	1.19
NOX CONCENTRATION PPM	61.2
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	48.23
CO MASS (GRAMS)	401.69
CO2 MASS (GRAMS)	1709.99
NOX MASS (GRAMS)	9.19
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	26.06 (41.94)
CO GRAMS/KM (GRAMS/MILE)	217.09 (349.30)
CO2 GRAMS/KM (GRAMS/MILE)	924 (1487)
NOX GRAMS/KM (GRAMS/MILE)	4.96 (7.95)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)

HC GRAMS/KG OF FUEL	61.30	HC GRAMS/MIN	10.02
CO GRAMS/KG OF FUEL	510.6	CO GRAMS/MIN	83.5
CO2 GRAMS/KG OF FUEL	2173	CO2 GRAMS/MIN	355
NOX GRAMS/KG OF FUEL	11.62	NOX GRAMS/MIN	1.90
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 57.52 (9.09)

TOTAL CVS FLOW= 81.6STD. CU. METRES

TABLE E-12. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/30/78	TIME -0 HRS,	TEST NO, 10
MODEL 1975 CHEV C-60 8L	RUN-2 BAG-2 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT, 7711 KG,	GVW 0 KG
WET BULB TEMP 15 C	DRY BULB TEMP 19 C	REL, HUM, 66.2 PCT
SPEC. HUM, 9.1 GRAM/KG	BARO, 748.0 MM HG,	MEASURED FUEL 0.00 KG
DISTANCE 5.906 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	9.98	MINUTES
BLOWER INLET PRESS,	508.0	MM, H20
BLOWER DIF, PRESS,	558.8	MM H20
BLOWER INLET TEMP,	65	DEG, C
DYNO REVOLUTIONS	-0	
BLOWER REVOLUTIONS	5001	
BLOWER CU, CM /REV,	16896	

BAG RESULTS

HC SAMPLE METER READING/SCALE	51.7/ 3	
HC SAMPLE PPM	517	
HC BACKGRD METER READING/SCALE	3.8/ 3	
HC BACKGRD PPM	38	
CO SAMPLE METER READING/SCALE	79.3/ 1	
CO SAMPLE PPM	9955	
CO BACKGRD METER READING/SCALE	.3/ 1	
CO BACKGRD PPM	17	
CO2 SAMPLE METER READING/SCALE	73.6/ 2	
CO2 SAMPLE PERCENT	3.75	
CO2 BACKGRD METER READING/SCALE	1.7/ 2	
CO2 BACKGRD PERCENT	.06	
NOX SAMPLE METER READING/SCALE	33.3/ 4	
NOX SAMPLE PPM	333.0	
NOX BACKGRD METER READING/SCALE	.1/ 4	
NOX BACKGRD PPM	1.0	
HC CONCENTRATION PPM	492	
CO CONCENTRATION PPM	8559	
CO2 CONCENTRATION PCT	3.71	
NOX CONCENTRATION PPM	332.3	
SO2 CONCENTRATION PPM	0.0	
HC MASS (GRAMS)	19.91	
CO MASS (GRAMS)	681.55	
CO2 MASS (GRAMS)	4648.81	
NOX MASS (GRAMS)	41.32	
SO2 MASS (GRAMS)	0.00	

HC GRAMS/KM (GRAMS/MILE)	3.59 (5.78)	
CO GRAMS/KM (GRAMS/MILE)	126.07 (202.84)	
CO2 GRAMS/KM (GRAMS/MILE)	860 (1384)	
NOX GRAMS/KM (GRAMS/MILE)	7.69 (12.30)	
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)	

HC GRAMS/KG OF FUEL	10.69	HC GRAMS/MIN	4.33
CO GRAMS/KG OF FUEL	373.6	CO GRAMS/MIN	152.2
CO2 GRAMS/KG OF FUEL	2549	CO2 GRAMS/MIN	1039
NOX GRAMS/KG OF FUEL	22.65	NOX GRAMS/MIN	9.23
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 45.69 (5.15)

TOTAL CVS FLOW= 68.4STD. CU. METRES

TABLE E-13. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/30/79	TIME -0 HRS.	TEST NO. 10
MODEL 1975 CHEV C-60 BL	RUN-2 BAG-3 21C	ENGINE 5.7 LITHEV 8
DRIVER REV	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 14 C	DRY BULB TEMP 19 C	REL. HUM. 66.7 PCT
SPEC. HUM. 9.5 GRAINS/KG	BARO. 747.8 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 1.830 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION 9.75 MINUTES
BLOWER INLET PRESS. 931.8 MM. H2O
BLOWER DIF. PRESS. 982.6 MM H2O
BLOWER INLET TEMP. 54 DEG. C
DYNO REVOLUTIONS -0
BLOWER REVOLUTIONS 5342
BLOWER CU. CM /REV. 16978

BAG RESULTS

HC	SAMPLE METER READING/SCALE	37.7/ 3
HC	SAMPLE PPM	377
HC	BACKGRD METER READING/SCALE	3.9/ 3
HC	BACKGRD PPM	39
CO	SAMPLE METER READING/SCALE	19.5/ 3
CO	SAMPLE PPM	1970
CO	BACKGRD METER READING/SCALE	.9/ 3
CO	BACKGRD PPM	16
CO2	SAMPLE METER READING/SCALE	60.1/ 3
CO2	SAMPLE PERCENT	1.06
CO2	BACKGRD METER READING/SCALE	3.6/ 3
CO2	BACKGRD PERCENT	.06
NOX	SAMPLE METER READING/SCALE	70.2/ 2
NOX	SAMPLE PPM	70.2
NOX	BACKGRD METER READING/SCALE	1.6/ 2
NOX	BACKGRD PPM	1.6
HC	CONCENTRATION PPM	392
CO	CONCENTRATION PPM	1879
CO2	CONCENTRATION PCT	1.02
NOX	CONCENTRATION PPM	68.8
SO2	CONCENTRATION PPM	0.0
HC	MASS (GRAMS)	15.07
CO	MASS (GRAMS)	166.80
CO2	MASS (GRAMS)	1921.25
NOX	MASS (GRAMS)	9.68
SO2	MASS (GRAMS)	0.00

HC	GRAMS/KM (GRAMS/MILE)	8.22 (	13.22)
CO	GRAMS/KM (GRAMS/MILE)	90.99 (	146.32)
CO2	GRAMS/KM (GRAMS/MILE)	775 (	1247)
NOX	GRAMS/KM (GRAMS/MILE)	5.28 (	8.49)
SO2	GRAMS/KM (GRAMS/MILE)	0.00 (	0.00)

HC	GRAMS/KG OF FUEL 27.59	HC	GRAMS/MIN 3.17
CO	GRAMS/KG OF FUEL 305.9	CO	GRAMS/MIN 39.1
CO2	GRAMS/KG OF FUEL 2602	CO2	GRAMS/MIN 299
NOX	GRAMS/KG OF FUEL 17.72	NOX	GRAMS/MIN 2.09
SO2	GRAMS/KG OF FUEL 0.00	SO2	GRAMS/MIN 0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 10.28 (9.64)

TOTAL CVS FLOW 76.5310. CU. METHES

TABLE E-14. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/30/78	TIME -0 HRS.	TEST NO. 18
MODEL 1975 CHEV C-60 8L	RUN-2 BAG-3 21C	ENGINE 5.7 LITHEV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 16 C	DRY BULB TEMP 21 C	REL. HUM. 63.3 PCT
SPEC. HUM. 9.7 GRAM/KG	BARO. 747.8 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 9.922 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION 9.60 MINUTES
BLOWER INLET PRESS. 982.6 MM. H20
BLOWER DIF. PRESS. 533.3 MM H20
BLOWER INLET TEMP. 82 DEG. C
DYNO REVOLUTIONS -0
BLOWER REVOLUTIONS 5156
BLOWER CU. CM /REV. 16899

BAG RESULTS

HC SAMPLE METER READING/SCALE	96.8/ 3
HC SAMPLE PPM	968
HC BACKGRD METER READING/SCALE	3.9/ 3
HC BACKGRD PPM	39
CO SAMPLE METER READING/SCALE	78.4/ 1
CO SAMPLE PPM	9227
CO BACKGRD METER READING/SCALE	.9/ 1
CO BACKGRD PPM	22
CO2 SAMPLE METER READING/SCALE	73.7/ 2
CO2 SAMPLE PERCENT	3.76
CO2 BACKGRD METER READING/SCALE	1.9/ 2
CO2 BACKGRD PERCENT	.07
NOX SAMPLE METER READING/SCALE	32.6/ 9
NOX SAMPLE PPM	326.0
NOX BACKGRD METER READING/SCALE	.2/ 9
NOX BACKGRD PPM	2.0
HC CONCENTRATION PPM	993
CO CONCENTRATION PPM	8356
CO2 CONCENTRATION PCT	3.71
NOX CONCENTRATION PPM	329.7
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	17.19
CO MASS (GRAMS)	855.96
CO2 MASS (GRAMS)	9581.82
NOX MASS (GRAMS)	90.98
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	3.17 (5.10)
CO GRAMS/KM (GRAMS/MILE)	120.88 (194.50)
CO2 GRAMS/KM (GRAMS/MILE)	845 (1360)
NOX GRAMS/KM (GRAMS/MILE)	7.97 (12.81)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)

HC GRAMS/KG OF FUEL	9.62	HC GRAMS/MIN	3.79
CO GRAMS/KG OF FUEL	366.6	CO GRAMS/MIN	192.9
CO2 GRAMS/KG OF FUEL	2563	CO2 GRAMS/MIN	996
NOX GRAMS/KG OF FUEL	22.69	NOX GRAMS/MIN	8.80
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 44.60 (5.27)

TOTAL CVS FLOW 62.4310. CU. METERS

TABLE E-15. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/30/78	TIME -0 HRS.	TEST NO. 10
MODEL 1975 CHEV C-60 6L	RUN-2 BAG-S 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 17 C	DRY BULB TEMP 21 C	REL. HUM. 72.0 PCT
SPEC. HUM. 11.1 GRAM/KG	BARO. 746.8 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE .885 KM	FUEL 736.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.17 MINUTES
BLOWER INLET PRESS.	444.5 MM. H20
BLOWER DIF. PRESS.	495.3 MM H20
BLOWER INLET TEMP.	60 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	4694
BLOWER CU. CM /REV.	16966

BAG RESULTS

HC SAMPLE METER READING/SCALE	35.9/ 3
HC SAMPLE PPM	359
HC BACKGRD METER READING/SCALE	3.3/ 3
HC BACKGRD PPM	33
CO SAMPLE METER READING/SCALE	62.9/ 3
CO SAMPLE PPM	1598
CO BACKGRD METER READING/SCALE	.6/ 3
CO BACKGRD PPM	14
CO2 SAMPLE METER READING/SCALE	47.9/ 3
CO2 SAMPLE PERCENT	.83
CO2 BACKGRD METER READING/SCALE	3.5/ 3
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	44.7/ 2
NOX SAMPLE PPM	44.7
NOX BACKGRD METER READING/SCALE	1.3/ 2
NOX BACKGRD PPM	1.3
HC CONCENTRATION PPM	329
CO CONCENTRATION PPM	1524
CO2 CONCENTRATION PCT	.78
NOX CONCENTRATION PPM	43.5
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	12.47
CO MASS (GRAMS)	116.80
CO2 MASS (GRAMS)	937.10
NOX MASS (GRAMS)	5.54
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	14.10	(22.68)
CO GRAMS/KM (GRAMS/MILE)	131.99	(212.37)
CO2 GRAMS/KM (GRAMS/MILE)	1059	(1704)
NOX GRAMS/KM (GRAMS/MILE)	6.26	(10.07)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	34.08	HC GRAMS/MIN	2.99
CO GRAMS/KG OF FUEL	319.1	CO GRAMS/MIN	28.0
CO2 GRAMS/KG OF FUEL	2560	CO2 GRAMS/MIN	225
NOX GRAMS/KG OF FUEL	15.14	NOX GRAMS/MIN	1.33
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 55.96 (4.20)

TOTAL CVS FLOW 66.9810. CU. METRES

TABLE E-16. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/30/78	TIME -0 HRS.	TEST NO. 10
MODEL 1975 CHEV C-50 BL	RUN-2 BAG-6 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 17 C	DRY BULB TEMP 22 C	REL. HUM. 64.4 PCT
SPEC. HUM. 10.6 GRAM/KG	BARO. 746.5 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 3.395 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.67	MINUTES
BLOWER INLET PRESS.	457.2	MM. H20
BLOWER DIF. PRESS.	508.0	MM H20
BLOWER INLET TEMP.	65	DEG. C
DYNO REVOLUTIONS	-0	
BLOWER REVOLUTIONS	5230	
BLOWER CU. CM /REV.	14937	

BAG RESULTS

HC SAMPLE METER READING/SCALE	45.4/ 3
HC SAMPLE PPM	454
HC BACKGRD METER READING/SCALE	3.5/ 3
HC BACKGRD PPM	35
CO SAMPLE METER READING/SCALE	90.9/ 2
CO SAMPLE PPM	5628
CO BACKGRD METER READING/SCALE	.4/ 2
CO BACKGRD PPM	15
CO2 SAMPLE METER READING/SCALE	44.6/ 2
CO2 SAMPLE PERCENT	1.98
CO2 BACKGRD METER READING/SCALE	1.9/ 2
CO2 BACKGRD PERCENT	.07
NOX SAMPLE METER READING/SCALE	47.2/ 3
NOX SAMPLE PPM	141.6
NOX BACKGRD METER READING/SCALE	.4/ 3
NOX BACKGRD PPM	1.2
HC CONCENTRATION PPM	426
CO CONCENTRATION PPM	5284
CO2 CONCENTRATION PCT	1.93
NOX CONCENTRATION PPM	140.6
SO2 CUCENTRATION PPM	0.0
HC MASS (GRAMS)	17.66
CO MASS (GRAMS)	442.49
CO2 MASS (GRAMS)	2536.70
NOX MASS (GRAMS)	19.26
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	5.20	(8.37)
CO GRAMS/KM (GRAMS/MILE)	130.34	(209.71)
CO2 GRAMS/KM (GRAMS/MILE)	748	(1203)
NOX GRAMS/KM (GRAMS/MILE)	5.67	(9.13)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	17.01	HC GRAMS/MIN	3.78
CO GRAMS/KG OF FUEL	426.3	CO GRAMS/MIN	94.8
CO2 GRAMS/KG OF FUEL	2446	CO2 GRAMS/MIN	544
NOX GRAMS/KG OF FUEL	18.55	NOX GRAMS/MIN	4.13
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 41.36 (5.69)

TOTAL CVS FLOW= 22.0STD. CU. METRES

TABLE E-17. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/30/78	TIME -0 HRS.	TEST NO. 10
MODEL 1975 CHEV C-60 8L	RUN-2 BAG-7 21C	ENGINE 5.7 LITHEV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 18 C	DRY BULB TEMP 22 C	REL. HUM. 64.8 PCT
SPEC. HUM. 11.0 GRAM/KG	BARO. 746.3 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 1.863 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.79	MINUTES
BLOWER INLET PRESS.	457.2	MM. H2O
BLOWER DIF. PRESS.	508.0	MM H2O
BLOWER INLET TEMP.	35	DEG. C
DYNO REVOLUTIONS	-0	
BLOWER REVOLUTIONS	5335	
BLOWER CU. CM /REV.	16799	

BAG RESULTS

HC SAMPLE METER READING/SCALE	52.2/ 3	
HC SAMPLE PPM	522	
HC BACKGRD METER READING/SCALE	4.0/ 3	
HC BACKGRD PPM	40	
CO SAMPLE METER READING/SCALE	71.1/ 3	
CO SAMPLE PPM	1857	
CO BACKGRD METER READING/SCALE	.1/ 3	
CO BACKGRD PPM	2	
CO2 SAMPLE METER READING/SCALE	64.4/ 3	
CO2 SAMPLE PERCENT	1.15	
CO2 BACKGRD METER READING/SCALE	4.0/ 3	
CO2 BACKGRD PERCENT	.06	
NOX SAMPLE METER READING/SCALE	79.8/ 2	
NOX SAMPLE PPM	79.8	
NOX BACKGRD METER READING/SCALE	1.2/ 2	
NOX BACKGRD PPM	1.2	
HC CONCENTRATION PPM	486	
CO CONCENTRATION PPM	1775	
CO2 CONCENTRATION PCT	1.10	
NOX CONCENTRATION PPM	78.7	
SO2 CONCENTRATION PPM	0.0	
HC MASS (GRAMS)	22.91	
CO MASS (GRAMS)	165.27	
CO2 MASS (GRAMS)	1609.17	
NOX MASS (GRAMS)	12.17	
SO2 MASS (GRAMS)	0.00	

HC GRAMS/KM (GRAMS/MILE)	11.91	(19.14)
CO GRAMS/KM (GRAMS/MILE)	87.79	(141.25)
CO2 GRAMS/KM (GRAMS/MILE)	852	(1371)
NOX GRAMS/KM (GRAMS/MILE)	6.46	(10.40)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	36.71	HC GRAMS/MIN	4.68
CO GRAMS/KG OF FUEL	270.7	CO GRAMS/MIN	34.5
CO2 GRAMS/KG OF FUEL	2628	CO2 GRAMS/MIN	335
NOX GRAMS/KG OF FUEL	19.93	NOX GRAMS/MIN	2.54
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 43.87 (5.36)

TOTAL CVS FLOW= 80.0STD. CU. METRES

TABLE E-18. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/30/78	TIME =0 HRS.	TEST NO. 10
MODEL 1975 CHEV C-60 BL	RUN-2 BAG-B 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 18 C	DRY BULB TEMP 24 C	REL. HUM. 58.5 PCT
SPEC. HUM. 11.0 GRAM/KG	BARO. 745.7 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 5.406 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.45 MINUTES
BLOWER INLET PRESS.	469.9 MM. H20
BLOWER DIF. PRESS.	520.7 MM H20
BLOWER INLET TEMP.	71 DEG. C
DYNO REVOLUTIONS	16314
BLOWER REVOLUTIONS	4961
BLOWER CU. CM /REV.	16917

BAG RESULTS

HC SAMPLE METER READING/SCALE	45.4/ 3
HC SAMPLE PPM	454
HC BACKGRD METER READING/SCALE	3.7/ 3
HC BACKGRD PPM	37
CO SAMPLE METER READING/SCALE	73.2/ 1
CO SAMPLE PPM	8023
CO BACKGRD METER READING/SCALE	.3/ 1
CO BACKGRD PPM	17
CO2 SAMPLE METER READING/SCALE	74.3/ 2
CO2 SAMPLE PERCENT	3.80
CO2 BACKGRD METER READING/SCALE	1.7/ 2
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	36.5/ 4
NOX SAMPLE PPM	365.0
NOX BACKGRD METER READING/SCALE	.2/ 4
NOX BACKGRD PPM	2.0
HC CONCENTRATION PPM	435
CO CONCENTRATION PPM	7274
CO2 CONCENTRATION PCT	3.76
NOX CONCENTRATION PPM	363.7
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	16.76
CO MASS (GRAMS)	566.41
CO2 MASS (GRAMS)	4604.05
NOX MASS (GRAMS)	47.01
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	3.10	(4.99)
CO GRAMS/KM (GRAMS/MILE)	104.77	(168.58)
CO2 GRAMS/KM (GRAMS/MILE)	852	(1370)
NOX GRAMS/KM (GRAMS/MILE)	8.69	(13.99)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	9.58	HC GRAMS/MIN	3.77
CO GRAMS/KG OF FUEL	323.6	CO GRAMS/MIN	127.3
CO2 GRAMS/KG OF FUEL	2631	CO2 GRAMS/MIN	1035
NOX GRAMS/KG OF FUEL	26.86	NOX GRAMS/MIN	10.57
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 43.79 (5.37)

TOTAL CVS FLOW= 66.9STD. CU. METRES

TABLE E-19. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/27/78	TIME -0 HRS.	TEST NO. 11
MODEL 1975 CHEV C-60 BL	RUN-1 BAG-1 21M	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 14 C	DRY BULB TEMP 24 C	REL. HUM. 28.8 PCT
SPEC. HUM. 5.6 GRAM/KG	BARO. 746.3 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 1.866 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.75	MINUTES
BLOWER INLET PRESS.	444.5	MM. H20
BLOWER DIF. PRESS.	482.6	MM H20
BLOWER INLET TEMP.	35	DEG. C
DYNO REVOLUTIONS	-0	
BLOWER REVOLUTIONS	5303	
BLOWER CU. CM /REV.	16820	

BAG RESULTS

HC SAMPLE METER READING/SCALE	54.6/ 3	
HC SAMPLE PPM	546	
HC BACKGRD METER READING/SCALE	3.6/ 3	
HC BACKGRD PPM	36	
CO SAMPLE METER READING/SCALE	63.8/ 3	
CO SAMPLE PPM	1626	
CO BACKGRD METER READING/SCALE	.1/ 3	
CO BACKGRD PPM	2	
CO2 SAMPLE METER READING/SCALE	65.6/ 3	
CO2 SAMPLE PERCENT	1.18	
CO2 BACKGRD METER READING/SCALE	3.9/ 3	
CO2 BACKGRD PERCENT	.06	
NOX SAMPLE METER READING/SCALE	79.6/ 2	
NOX SAMPLE PPM	79.6	
NOX BACKGRD METER READING/SCALE	1.1/ 2	
NOX BACKGRD PPM	1.1	
HC CONCENTRATION PPM	514	
CO CONCENTRATION PPM	1572	
CO2 CONCENTRATION PCT	1.12	
NOX CONCENTRATION PPM	78.6	
SO2 CONCENTRATION PPM	0.0	
HC MASS (GRAMS)	23.60	
CO MASS (GRAMS)	145.82	
CO2 MASS (GRAMS)	1635.91	
NOX MASS (GRAMS)	10.24	
SO2 MASS (GRAMS)	0.00	

HC GRAMS/KM (GRAMS/MILE)	12.65	(20.35)
CO GRAMS/KM (GRAMS/MILE)	78.13	(125.71)
CO2 GRAMS/KM (GRAMS/MILE)	876	(1410)
NOX GRAMS/KM (GRAMS/MILE)	5.49	(8.83)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	38.56	HC GRAMS/MIN	4.97
CO GRAMS/KG OF FUEL	238.2	CO GRAMS/MIN	30.7
CO2 GRAMS/KG OF FUEL	2673	CO2 GRAMS/MIN	345
NOX GRAMS/KG OF FUEL	16.73	NOX GRAMS/MIN	2.16
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 44.36 (5.30)

TOTAL CVS FLOW= 79.7STD. CU. METRES

TABLE E-20. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/23/78	TIME -0 HRS.	TEST NO. 11
MODEL 1975 CHEV C-60 BL	RUN-1 BAG-2 21M	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 14 C	DRY BULB TEMP 26 C	REL. HUM. 24.7 PCT
SPEC. HUM. 5.1 GRAM/KG	BARO. 746.5 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 5.422 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	9.48 MINUTES
BLOWER INLET PRESS.	508.0 MM. H20
BLOWER DIF. PRESS.	546.1 MM H20
BLOWER INLET TEMP.	65 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	4991
BLOWER CU. CM /REV.	16902

BAG RESULTS	
HC SAMPLE METER READING/SCALE	40.5/ 3
HC SAMPLE PPM	405
HC BACKGRD METER READING/SCALE	3.8/ 3
HC BACKGRD PPM	38
CO SAMPLE METER READING/SCALE	68.8/ 1
CO SAMPLE PPM	7133
CO BACKGRD METER READING/SCALE	.2/ 1
CO BACKGRD PPM	11
CO2 SAMPLE METER READING/SCALE	74.0/ 2
CO2 SAMPLE PERCENT	3.78
CO2 BACKGRD METER READING/SCALE	1.7/ 2
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	34.3/ 4
NOX SAMPLE PPM	343.0
NOX BACKGRD METER READING/SCALE	.2/ 4
NOX BACKGRD PPM	2.0
HC CONCENTRATION PPM	380
CO CONCENTRATION PPM	6550
CO2 CONCENTRATION PCT	3.74
NOX CONCENTRATION PPM	341.7
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	14.92
CO MASS (GRAMS)	519.58
CO2 MASS (GRAMS)	9664.06
NOX MASS (GRAMS)	37.56
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	2.75 (4.43)	
CO GRAMS/KM (GRAMS/MILE)	95.82 (154.18)	
CO2 GRAMS/KM (GRAMS/MILE)	860 (1384)	
NOX GRAMS/KM (GRAMS/MILE)	6.93 (11.15)	
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)	
HC GRAMS/KG OF FUEL 8.55	HC GRAMS/MIN	3.33
CO GRAMS/KG OF FUEL 297.9	CO GRAMS/MIN	115.4
CO2 GRAMS/KG OF FUEL 2674	CO2 GRAMS/MIN	1040
NOX GRAMS/KG OF FUEL 21.54	NOX GRAMS/MIN	8.38
SO2 GRAMS/KG OF FUEL 0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 43.51 (5.41)

TOTAL CVS FLOW 68.2STD. CU. METRES

TABLE E-21. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/29/78	TIME -0 HRS.	TEST NO. 11
MODEL 1975 CHEV C-60 BL	RUN-1 BAG-3 21M	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 15 C	DRY BULB TEMP 26 C	REL. HUM. 28.4 PCT
SPEC. HUM. 4.1 GRAM/KG	BARO. 746.5 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE .869 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.24 MINUTES
BLOWER INLET PRESS.	431.8 MM. H20
BLOWER DIF. PRESS.	482.6 MM H20
BLOWER INLET TEMP.	54 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	4753
BLOWER CU. CM /REV.	16974

BAG RESULTS

HC SAMPLE METER READING/SCALE	37.1/ 3
HC SAMPLE PPM	371
HC BACKGRD METER READING/SCALE	3.8/ 3
HC BACKGRD PPM	38
CO SAMPLE METER READING/SCALE	58.0/ 3
CO SAMPLE PPM	1451
CO BACKGRD METER READING/SCALE	.1/ 3
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	48.2/ 3
CO2 SAMPLE PERCENT	.83
CO2 BACKGRD METER READING/SCALE	3.9/ 3
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	44.4/ 2
NOX SAMPLE PPM	44.4
NOX BACKGRD METER READING/SCALE	1.6/ 2
NOX BACKGRD PPM	1.6
HC CONCENTRATION PPM	336
CO CONCENTRATION PPM	1413
CO2 CONCENTRATION PCT	.78
NOX CONCENTRATION PPM	42.9
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	13.15
CO MASS (GRAMS)	111.70
CO2 MASS (GRAMS)	966.32
NOX MASS (GRAMS)	4.83
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	15.14	(24.36)
CO GRAMS/KM (GRAMS/MILE)	128.56	(206.85)
CO2 GRAMS/KM (GRAMS/MILE)	1112	(1789)
NOX GRAMS/KM (GRAMS/MILE)	5.56	(8.95)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	35.22	HC GRAMS/MIN	3.10
CO GRAMS/KG OF FUEL	299.1	CO GRAMS/MIN	26.3
CO2 GRAMS/KG OF FUEL	2588	CO2 GRAMS/MIN	228
NOX GRAMS/KG OF FUEL	12.95	NOX GRAMS/MIN	1.14
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 58.14 (4.05)

TOTAL CVS FLOW= 69.98STD. CU. METRES

TABLE E-22. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/27/78	TIME -0 HRS.	TEST NO. 11
MODEL 1975 CHEV C-60 BL	RUN-1 BAG-9 21M	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 15 C	DRY BULB TEMP 27 C	REL. HUM. 26.5 PCT
SPEC. HUM. 5.8 GRAM/KG	BARO. 746.8 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 3.395 KM	FUEL 738.2 G/LITRE	FUEL MC RATIO 1.860

RUN DURATION	9.67 MINUTES
BLOWER INLET PRESS.	495.3 MM. H20
BLOWER DIF. PRESS.	533.9 MM H20
BLOWER INLET TEMP.	60 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5229
BLOWER CU. CM /REV.	16929

BAG RESULTS

HC SAMPLE METER READING/SCALE	50.2/ 3
HC SAMPLE PPM	502
HC BACKGRD METER READING/SCALE	3.7/ 3
HC BACKGRD PPM	37
CO SAMPLE METER READING/SCALE	83.0/ 2
CO SAMPLE PPM	4883
CO BACKGRD METER READING/SCALE	.3/ 2
CO BACKGRD PPM	11
CO2 SAMPLE METER READING/SCALE	92.9/ 2
CO2 SAMPLE PERCENT	1.89
CO2 BACKGRD METER READING/SCALE	1.7/ 2
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	46.7/ 3
NOX SAMPLE PPM	140.1
NOX BACKGRD METER READING/SCALE	.5/ 3
NOX BACKGRD PPM	1.5
HC CONCENTRATION PPM	472
CO CONCENTRATION PPM	4654
CO2 CONCENTRATION PCT	1.84
NOX CONCENTRATION PPM	138.9
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	19.78
CO MASS (GRAMS)	394.14
CO2 MASS (GRAMS)	2453.02
NOX MASS (GRAMS)	16.64
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	5.83 (9.38)	
CO GRAMS/KM (GRAMS/MILE)	116.10 (186.80)	
CO2 GRAMS/KM (GRAMS/MILE)	723 (1163)	
NOX GRAMS/KM (GRAMS/MILE)	4.90 (7.89)	
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)	
HC GRAMS/KG OF FUEL 20.00	HC GRAMS/MIN	4.23
CO GRAMS/KG OF FUEL 398.5	CO GRAMS/MIN	84.3
CO2 GRAMS/KG OF FUEL 2480	CO2 GRAMS/MIN	525
NOX GRAMS/KG OF FUEL 16.82	NOX GRAMS/MIN	3.56
SO2 GRAMS/KG OF FUEL 0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 39.41 (5.97)

TOTAL CVS FLOW= 72.8STD. CU. METRES

TABLE E-23. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/29/78	TIME -0 HRS.	TEST NO. 11
MODEL 1975 CHEV C-60 BL	RUN-2 BAG-1 21M	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 13 C	DRY BULB TEMP 24 C	REL. HUM. 22.8 PCT
SPEC. HUM. 4.4 GRAM/KG	BARO. 745.5 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 1.866 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.69	MINUTES
BLOWER INLET PRESS.	431.8	MM. H20
BLOWER DIF. PRESS.	482.6	MM H20
BLOWER INLET TEMP.	37	DEG. C
DYNO REVOLUTIONS	-0	
BLOWER REVOLUTIONS	5256	
BLOWER CU. CM /REV.	16862	

BAG RESULTS

HC SAMPLE METER READING/SCALE	55.0/ 3	
HC SAMPLE PPM	550	
HC BACKGRD METER READING/SCALE	3.5/ 3	
HC BACKGRD PPM	35	
CO SAMPLE METER READING/SCALE	69.1/ 3	
CO SAMPLE PPM	1793	
CO BACKGRD METER READING/SCALE	.1/ 3	
CO BACKGRD PPM	2	
CO2 SAMPLE METER READING/SCALE	63.9/ 3	
CO2 SAMPLE PERCENT	1.14	
CO2 BACKGRD METER READING/SCALE	3.3/ 3	
CO2 BACKGRD PERCENT	.05	
NOX SAMPLE METER READING/SCALE	77.9/ 2	
NOX SAMPLE PPM	77.9	
NOX BACKGRD METER READING/SCALE	1.9/ 2	
NOX BACKGRD PPM	1.9	
HC CONCENTRATION PPM	518	
CO CONCENTRATION PPM	1738	
CO2 CONCENTRATION PCT	1.10	
NOX CONCENTRATION PPM	76.6	
SO2 CONCENTRATION PPM	0.0	
HC MASS (GRAMS)	23.47	
CO MASS (GRAMS)	158.80	
CO2 MASS (GRAMS)	1574.11	
NOX MASS (GRAMS)	9.52	
SO2 MASS (GRAMS)	0.00	

HC GRAMS/KM (GRAMS/MILE)	12.57 (	20.23)
CO GRAMS/KM (GRAMS/MILE)	85.08 (	136.90)
CO2 GRAMS/KM (GRAMS/MILE)	843 (	1357)
NOX GRAMS/KM (GRAMS/MILE)	5.10 (	8.21)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (	0.00)

HC GRAMS/KG OF FUEL	34.19	HC GRAMS/MIN	5.01
CO GRAMS/KG OF FUEL	265.2	CO GRAMS/MIN	33.9
CO2 GRAMS/KG OF FUEL	2629	CO2 GRAMS/MIN	336
NOX GRAMS/KG OF FUEL	15.90	NOX GRAMS/MIN	2.03
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 43.40 (5.42)

TOTAL CVS FLOW 28.5570. CU. METRES

TABLE E-24. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/29/78	TIME -0 HRS,	TEST NO. 11
MODEL 1975 CHEV C-60 BL	RUN-2 BAG-2 21M	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG,	GVW 0 KG
WET BULB TEMP 19 C	DRY BULB TEMP 26 C	REL. HUM. 27.6 PCT
SPEC. HUM. 5.7 GRAM/KG	BARO. 745.5 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 5.455 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.48 MINUTES
BLOWER INLET PRESS.	669.9 MM. H20
BLOWER DIF. PRESS.	508.0 MM H20
BLOWER INLET TEMP.	65 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5020
BLOWER CU. CM /REV.	16936

BAG RESULTS

HC SAMPLE METER READING/SCALE	42.5/ 3
HC SAMPLE PPM	425
HC BACKGRD METER READING/SCALE	3.1/ 3
HC BACKGRD PPM	31
CO SAMPLE METER READING/SCALE	70.8/ 1
CO SAMPLE PPM	7525
CO BACKGRD METER READING/SCALE	.2/ 1
CO BACKGRD PPM	11
CO2 SAMPLE METER READING/SCALE	73.0/ 2
CO2 SAMPLE PERCENT	3.71
CO2 BACKGRD METER READING/SCALE	1.8/ 2
CO2 BACKGRD PERCENT	.07
NOX SAMPLE METER READING/SCALE	32.8/ 4
NOX SAMPLE PPM	328.0
NOX BACKGRD METER READING/SCALE	.1/ 4
NOX BACKGRD PPM	1.0
HC CONCENTRATION PPM	404
CO CONCENTRATION PPM	6913
CO2 CONCENTRATION PCT	3.67
NOX CONCENTRATION PPM	327.3
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	16.05
CO MASS (GRAMS)	554.03
CO2 MASS (GRAMS)	4623.58
NOX MASS (GRAMS)	36.99
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	2.94 (4.73)
CO GRAMS/KM (GRAMS/MILE)	101.57 (163.43)
CO2 GRAMS/KM (GRAMS/MILE)	848 (1364)
NOX GRAMS/KM (GRAMS/MILE)	6.78 (10.91)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)

HC GRAMS/KG OF FUEL	9.17	HC GRAMS/MIN	3.58
CO GRAMS/KG OF FUEL	316.7	CO GRAMS/MIN	123.5
CO2 GRAMS/KG OF FUEL	2643	CO2 GRAMS/MIN	1031
NOX GRAMS/KG OF FUEL	21.14	NOX GRAMS/MIN	8.25
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 43.39 (5.42)

TOTAL CVS FLOW 68.9STD. CU. METRES

TABLE E-25. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/27/78	TIME -0 HRS.	TEST NO. 11
MODEL 1975 CHEV C-60 8L	RUN-2 BAG-3	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 15 C	DRY BULB TEMP 26 C	REL. HUM. 28.5 PCT
SPEC. HUM. 6.1 GRAM/KG	BARO. 745.2 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE .853 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.23 MINUTES
BLOWER INLET PRESS.	444.5 MM. H20
BLOWER DIF. PRESS.	482.6 MM H20
BLOWER INLET TEMP.	60 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	4751
BLOWER CU. CM /REV.	1693

BAG RESULTS	
HC SAMPLE METER READING/SCALE	39.3/ 3
HC SAMPLE PPM	393
HC BACKGRD METER READING/SCALE	4.0/ 3
HC BACKGRD PPM	40
CO SAMPLE METER READING/SCALE	58.6/ 3
CO SAMPLE PPM	1469
CO BACKGRD METER READING/SCALE	.5/ 3
CO BACKGRD PPM	11
CO2 SAMPLE METER READING/SCALE	45.7/ 3
CO2 SAMPLE PERCENT	.78
CO2 BACKGRD METER READING/SCALE	3.9/ 3
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	41.7/ 2
NOX SAMPLE PPM	41.7
NOX BACKGRD METER READING/SCALE	1.6/ 2
NOX BACKGRD PPM	1.6
HC CONCENTRATION PPM	356
CO CONCENTRATION PPM	1423
CO2 CONCENTRATION PCT	.73
NOX CONCENTRATION PPM	40.2
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	13.65
CO MASS (GRAMS)	110.24
CO2 MASS (GRAMS)	888.69
NOX MASS (GRAMS)	4.69
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	16.01 (	25.76)
CO GRAMS/KM (GRAMS/MILE)	129.27 (	208.00)
CO2 GRAMS/KM (GRAMS/MILE)	1042 (	1676)
NOX GRAMS/KM (GRAMS/MILE)	5.21 (	8.38)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (	0.00)

HC GRAMS/KG OF FUEL	39.17	HC GRAMS/MIN	3.23
CO GRAMS/KG OF FUEL	316.2	CO GRAMS/MIN	26.1
CO2 GRAMS/KG OF FUEL	2548	CO2 GRAMS/MIN	210
NOX GRAMS/KG OF FUEL	12.74	NOX GRAMS/MIN	1.05
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 55.31 (4.25)

TOTAL CVS FLOW= 66.6STD. CU. METRES

TABLE E-26. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/29/78	TIME 08 HRS.	TEST NO. 11
MODEL 1975 CHEV C-60 BL	RUN-2 BAG-4 21M	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 3711 KG.	CVS 0 KG
WET BULB TEMP 16 C	DRY BULB TEMP 27 C	REL. HUM. 29.3 PCT
SPEC. HUM. 6.5 GRAM/KG	BARO. 745.2 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 3.347 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	9.69 MINUTES
BLOWER INLET PRESS.	457.2 MM. H20
BLOWER DIF. PRESS.	695.3 MM H20
BLOWER INLET TEMP.	42 DEG. C
DYNO REVOLUTIONS	0
BLOWER REVOLUTIONS	5250
BLOWER CU. CM /REV.	1695S

BAG RESULTS

HC SAMPLE METER READING/SCALE	48.3/ 3
HC SAMPLE PPM	483
HC BACKGRD METER READING/SCALE	3.8/ 3
HC BACKGRD PPM	38
CO SAMPLE METER READING/SCALE	82.1/ 2
CO SAMPLE PPM	4802
CO BACKGRD METER READING/SCALE	.2/ 2
CO BACKGRD PPM	8
CO2 SAMPLE METER READING/SCALE	97.1/ 3
CO2 SAMPLE PERCENT	1.83
CO2 BACKGRD METER READING/SCALE	3.4/ 3
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	42.8/ 3
NOX SAMPLE PPM	128.4
NOX BACKGRD METER READING/SCALE	.4/ 3
NOX BACKGRD PPM	1.2
HC CONCENTRATION PPM	452
CO CONCENTRATION PPM	4681
CO2 CONCENTRATION PCT	1.78
NOX CONCENTRATION PPM	127.4
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	18.94
CO MASS (GRAMS)	387.96
CO2 MASS (GRAMS)	2368.06
NOX MASS (GRAMS)	15.55
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	5.66	(9.11)
CO GRAMS/KM (GRAMS/MILE)	115.92	(186.52)
CO2 GRAMS/KM (GRAMS/MILE)	708	(1138)
NOX GRAMS/KM (GRAMS/MILE)	4.65	(7.48)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	19.77	HC GRAMS/MIN	4.04
CO GRAMS/KG OF FUEL	404.8	CO GRAMS/MIN	82.8
CO2 GRAMS/KG OF FUEL	2471	CO2 GRAMS/MIN	505
NOX GRAMS/KG OF FUEL	16.23	NOX GRAMS/MIN	3.32
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 38.74 (6.07)

TOTAL CVS FLOW 72.8STD. CU. METRES

TABLE E-27. VEHICLE EMISSION RESULTS

1978 LIGHT DUTY EMISSIONS TEST

ACTUAL DISTANCES USED IN CALCULATIONS

UNIT NO. 20 TEST NO. 12-1 DATE 1/26/78 MFGR. CODE -8 YR. 1978

VEHICLE MODEL CHEV C-60 BL ENGINE 5.7L LITRE 8 CURB WT. 0 KG GVW 0 KG

BAROMETER 749.78 MM OF HG.
DRY BULB TEMP. 20.0 DEG. C
REL. HUMIDITY 69 PCT.

WET BULB TEMP 13.9 DEG. C
ABS. HUMIDITY 7.9 GRAMS/KG
COMMENTS

EXHAUST EMISSIONS

BLOWER ORIF. PRESS.. 02. 482.6 MM. H20
BAG RESULTS

BLOWER INLET PRESS.. 01 999.5 MM. H20
BLOWER INLET TEMP. 68 DEG. C

		1	2	3
	BAG NO.			
	BLOWER REVOLUTIONS	9961	19191	9999
HC	SAMPLE METER READING/SCALE	88.2/ 3	38.6/ 3	60.1/ 3
HC	SAMPLE PPM	882	386	601
HC	BACKGRD METER READING/SCALE	2.6/ 3	2.7/ 3	2.8/ 3
HC	BACKGRD PPM	26	27	28
CO	SAMPLE METER READING/SCALE	69.9/ 1	66.9/ 1	92.9/ 2
CO	SAMPLE PPM	9268	1787	9276
CO	BACKGRD METER READING/SCALE	.2/ 1	.1/ 1	.2/ 2
CO	BACKGRD PPM	11	2	8
CO2	SAMPLE METER READING/SCALE	93.9/ 2	80.9/ 1	95.9/ 2
CO2	SAMPLE PERCENT	2.15	1.98	2.01
CO2	BACKGRD METER READING/SCALE	1.5/ 2	3.2/ 1	1.9/ 2
CO2	BACKGRD PERCENT	.05	.05	.05
NOX	SAMPLE METER READING/SCALE	95.8/ 3	36.9/ 3	59.9/ 3
NOX	SAMPLE PPM	197.9	109.2	161.7
NOX	BACKGRD METER READING/SCALE	.2/ 3	.2/ 3	.3/ 3
NOX	BACKGRD PPM	.6	.6	.9
SO2	SAMPLE METER READING/SCALE	-0.0/-0	-0.0/-0	-0.0/-0
SO2	SAMPLE PPM	-0.0	-0.0	-0.0
SO2	BACKGRD METER READING/SCALE	-0.0/-0	-0.0/-0	-0.0/-0
SO2	BACKGRD PPM	-0.0	-0.0	-0.0
HC	CONCENTRATION PPM	862	362	579
CO	CONCENTRATION PPM	6920	1629	5951
CO2	CONCENTRATION PCT	2.12	1.99	1.99
NOX	CONCENTRATION PPM	136.9	108.7	161.0
SO2	CONCENTRATION PPM	0.0	0.0	0.0
HC	MASS GRAMS	44.07	17.96	29.30
CO	MASS GRAMS	1055.76	930.62	892.67
CO2	MASS GRAMS	5166.36	5976.97	4828.79
NOX	MASS GRAMS	21.92	12.60	24.89
SO2	MASS GRAMS	0.00	0.00	0.00
HC	GRAMS/KM (GRAMS/MILE)	11.27 (18.98)	7.69 (12.26)	9.98 (16.09)
CO	GRAMS/KM (GRAMS/MILE)	188.01 (302.51)	69.12 (111.22)	148.03 (238.18)
CO2	GRAMS/KM (GRAMS/MILE)	920.0 (1480.3)	959.4 (1543.6)	808.2 (1300.8)
NOX	GRAMS/KM (GRAMS/MILE)	6.60 (9.88)	6.80 (11.00)	6.68 (10.93)
	FUEL CONSUMPTION BY CB L/100KM (MPG)	52.97 (9.48)	40.61 (5.85)	47.19 (9.98)
	CVS FLOW STD. CU. METRES (SCF)	139.8 (9888.8)	227.1 (8020.7)	139.8 (9888.8)
	CALCULATED DISTANCE KM(MILES)	5.62 (3.49)	5.23 (3.87)	5.69 (3.54)

WEIGHTED FUEL CONSUMPTION LITRES/100KM (MPG)	48.17 (9.88)
WEIGHTED MASS HC GRAMS/KM (GRAMS/MILE)	8.51 (13.69)
WEIGHTED MASS CO GRAMS/KM (GRAMS/MILE)	119.83 (189.76)
WEIGHTED MASS COP GRAMS/KM (GRAMS/MILE)	871.1 (1382.1)
WEIGHTED MASS NOX GRAMS/KM (GRAMS/MILE)	6.99 (10.99)

TOTAL CVS FLOW = 448.9 STD. CU. METRES

TABLE E-28. VEHICLE EMISSION RESULTS

1978 LIGHT DUTY EMISSIONS TEST

ACTUAL DISTANCES USED IN CALCULATIONS

UNIT NO. 20 TEST NO. 18-1 DATE 1/30/78 MFGR. CODE -0 YR. 1976

VEHICLE MODEL CHEV C-60 BL ENGINE 5.7L LITRE 8 CUBE NT. 0 KG GVW 0 KG

BAROMETER 705.66 MM OF HG.
DRY BULB TEMP. 27.2 DEG. C
REL. HUMIDITY 30 PCT.

WET BULB TEMP 10.1 DEG. C
ABS. HUMIDITY 6.9 GRAMS/KG
COMMENTS

EXHAUST EMISSIONS

BLOWER DIF. PRESS.. 60. 482.6 MM. H20
BAG RESULTS
BAG NO.
BLOWER REVOLUTIONS

BLOWER INLET PRESS.. 61 994.6 MM. H20
BLOWER INLET TEMP. 60 DEG. C

		1	2	3
HC	SAMPLE METER READING/SCALE	9963	10181	9936
HC	SAMPLE PPM	10.9/ 9	11.6/ 3	66.5/ 3
HC	BACKGRD METER READING/SCALE	1000	916	665
HC	BACKGRD PPM	.9/ 9	1.5/ 3	3.1/ 3
CO	SAMPLE METER READING/SCALE	40	35	31
CO	SAMPLE PPM	78.6/ 1	78.5/ 3	99.0/ 2
CO	BACKGRD METER READING/SCALE	8110	2100	6650
CO	BACKGRD PPM	.2/ 1	.2/ 3	.3/ 2
CO2	SAMPLE METER READING/SCALE	11	5	11
CO2	SAMPLE PERCENT	99.5/ 2	79.6/ 3	95.9/ 2
CO2	BACKGRD METER READING/SCALE	2.05	1.94	2.03
CO2	BACKGRD PERCENT	1.9/ 2	1.9/ 3	1.9/ 2
NOX	SAMPLE METER READING/SCALE	.05	.06	.02
NOX	SAMPLE PPM	93.1/ 3	32.9/ 3	51.2/ 3
NOX	BACKGRD METER READING/SCALE	191.3	98.2	153.6
NOX	BACKGRD PPM	.2/ 3	.3/ 3	.3/ 3
SO2	SAMPLE METER READING/SCALE	.4	.9	.9
SO2	SAMPLE PPM	-0.0/-0	-0.0/-0	-0.0/-0
SO2	BACKGRD METER READING/SCALE	-0.0	-0.0	-0.0
SO2	BACKGRD PPM	-0.0/-0	-0.0/-0	-0.0/-0
		-0.0	-0.0	-0.0
HC	CONCENTRATION PPM	1009	985	640
CO	CONCENTRATION PPM	3670	2029	4191
CO2	CONCENTRATION PCT	2.22	1.91	1.97
NOX	CONCENTRATION PPM	100.8	97.6	152.9
SO2	CONCENTRATION PPM	0.0	0.0	0.0
HC	MASS GRAMS	99.15	50.19	98.74
CO	MASS GRAMS	1193.73	532.08	993.30
CO2	MASS GRAMS	5376.97	5824.39	9771.47
NOX	MASS GRAMS	31.78	17.54	39.91
SO2	MASS GRAMS	0.00	0.00	0.00
HC	GRAMS/KM (GRAMS/MILE)	13.54 (21.89)	7.47 (12.02)	8.98 (13.64)
CO	GRAMS/KM (GRAMS/MILE)	208.53 (335.58)	84.09 (135.99)	163.40 (263.71)
CO2	GRAMS/KM (GRAMS/MILE)	947.1 (1529.9)	925.2 (1488.6)	829.1 (1339.0)
NOX	GRAMS/KM (GRAMS/MILE)	5.58 (8.98)	5.06 (8.59)	5.96 (9.59)
	FUEL CONSUMPTION KM PER CB L/100KM (MPG)	56.05 (9.18)	46.23 (5.09)	47.53 (4.95)
	CVS FLOW STD. CU. METRES (SCF)	132.5 (4680.8)	225.8 (7976.1)	132.2 (4666.9)
	CALCULATED DISTANCE KM(MILES)	5.68 (3.53)	6.30 (3.91)	5.74 (3.58)

WEIGHTED FUEL CONSUMPTION LITRES/100KM (MPG)	48.63 (5.89)
WEIGHTED MASS HC GRAMS/KM (GRAMS/MILE)	9.25 (14.89)
WEIGHTED MASS CO GRAMS/KM (GRAMS/MILE)	131.34 (211.40)
WEIGHTED MASS CO2 GRAMS/KM (GRAMS/MILE)	903.5 (1453.7)
WEIGHTED MASS NOX GRAMS/KM (GRAMS/MILE)	5.88 (9.47)

TOTAL CVS FLOW = 490.4 STD. CU. METRES

APPENDIX F

CHASSIS DYNAMOMETER TRANSIENT TEST RESULTS -
EMISSION CONTROL SYSTEM

TABLES F-1 & F-2	Summary of the Results
TABLES F-3 through F-10	CAPE-21C - Run 1
TABLES F-11 through F-18	CAPE-21C - Run 2
TABLES F-19 through F-22	CAPE-21H - Run 1
TABLES F-23 through F-26	CAPE-21H - Run 2
TABLES F-27 through F-28	Light-Duty FTP

TABLE F-1. CHASSIS DYNAMOMETER TRANSIENT EVALUATIONS WITH THE EMISSION CONTROL SYSTEM

Test	Cycle	Bag	Emissions, g/km				Fuel	Emissions, g/km				Fuel
			HC	CO	NO_x	CO_2	ℓ/100km	HC	CO	NO_x	CO_2	ℓ/100km
CAPE-21C	LA-NF	1	18.74	111.94	3.14	1044	54.61	15.95	97.68	2.97	1021	52.29
	LA-F	2	0.59	17.83	5.71	993	43.64	0.37	14.68	5.23	998	43.62
	LA-NF	3	4.12	15.15	2.74	852	37.95	3.51	15.35	2.68	863	38.35
	LA-F	4	0.54	22.07	4.73	958	42.45	0.57	22.53	4.10	932	41.37
	NY-NF	5	9.78	20.55	5.21	1132	51.01	9.04	23.35	4.36	1086	49.16
	NY-F	6	1.24	9.41	4.42	838	36.56	1.41	10.75	4.08	816	35.72
	LA-NF	7	6.27	22.89	3.06	877	39.79	8.04	20.77	3.42	900	40.88
	LA-F	8	0.64	18.05	4.95	958	42.17	0.66	17.55	4.34	908	40.04
CAPE-21H	LA-NF	1	7.91	23.33	3.09	907	41.35	8.60	24.85	3.07	872	40.06
	LA-F	2	0.67	24.61	5.28	984	43.72	0.70	22.71	4.64	976	43.26
	NY-NF	3	12.81	33.87	4.60	1115	51.61	10.30	30.50	3.99	1149	52.48
	NY-F	4	1.46	13.26	4.25	876	38.49	1.60	15.23	4.00	867	38.24
LD-FTP	505C	1	6.70	46.06	5.86	1087	50.40	5.30	54.58	5.77	1161	53.92
	867S	2	5.30	18.45	4.83	1050	46.76	5.81	16.55	4.47	1031	45.92
	505H	3	4.43	24.73	6.47	1053	47.22	4.34	19.70	6.85	1015	45.24
	TOTAL		5.35	25.8	5.48	1058	47.62	5.31	25.14	5.38	1053	47.36

TABLE F-2. CHASSIS DYNAMOMETER TRANSIENT EVALUATIONS WITH THE EMISSION CONTROL SYSTEM

Test	Cycle	Bag	Emissions, g/min				Fuel g/min	Emissions, g/min				Fuel g/min
			HC	CO	NO_x	CO_2		HC	CO	NO_x	CO_2	
CAPE-21C	LA-NF	1	7.18	42.9	1.20	400	154.6	6.10	37.4	1.14	390	147.6
	LA-F	2	0.71	21.4	6.85	1191	387.1	0.47	18.6	6.64	1265	408.9
	LA-NF	3	1.60	5.9	1.07	331	109.0	1.36	6.0	1.04	335	110.0
	LA-F	4	0.65	26.6	5.70	1154	378.0	0.69	27.1	4.94	1122	368.1
	NY-NF	5	1.94	4.1	1.03	224	74.6	1.85	4.8	0.89	223	74.6
	NY-F	6	0.91	6.9	3.24	613	197.7	1.02	7.8	2.95	590	191.0
	LA-NF	7	2.43	8.9	1.19	339	113.8	3.05	7.9	1.30	341	114.5
	LA-F	8	0.77	21.7	5.96	1152	375.0	0.80	21.2	5.25	1098	357.8
CAPE-21H	LA-NF	1	3.02	8.9	1.18	347	117.0	3.34	9.7	1.19	339	115.1
	LA-F	2	0.79	29.0	6.23	1159	380.9	0.84	27.3	5.58	1172	384.1
	NY-NF	3	2.64	7.0	0.95	230	78.7	2.11	6.3	0.82	236	79.7
	NY-F	4	1.06	9.6	3.08	635	206.2	1.15	10.9	2.87	623	203.1
LD-FTP	505C	1	4.45	30.6	3.89	722	247.1	3.55	36.6	3.86	777	266.4
	867S	2	2.30	8.0	2.09	454	149.3	2.54	7.24	1.95	451	148.3
	505H	3	2.97	16.6	4.33	705	233.4	2.92	13.3	4.61	684	225.1
	TOTAL		2.79	13.4	2.86	552	183.4	2.77	13.1	2.80	549	182.3

TABLE F-3. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/11/78	TIME -0 HRS.	TEST NO. 3
MODEL 1975 CHEV C-60 ECS	RUN-3 BAG-1 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 18 C	DRY BULB TEMP 27 C	REL. HUM. 44.4 PCT
SPEC. HUM. 9.9 GRAM/KG	BARO. 742.4 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 1.850 KM	FUEL 738.2 G/LITRE	FUEL MC RATIO 1.860

RUN DURATION	4.83 MINUTES
BLOWER INLET PRESS.	381.0 MM. H20
BLOWER DIF. PRESS.	424.2 MM H20
BLOWER INLET TEMP.	37 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5528
BLOWER CU. CM /REV.	16920

BAG RESULTS

HC SAMPLE METER READING/SCALE	74.4/ 3
HC SAMPLE PPM	744
HC BACKGRD METER READING/SCALE	2.1/ 3
HC BACKGRD PPM	21
CO SAMPLE METER READING/SCALE	92.2/ 3
CO SAMPLE PPM	2239
CO BACKGRD METER READING/SCALE	.2/ 3
CO BACKGRD PPM	5
CO2 SAMPLE METER READING/SCALE	73.0/ 3
CO2 SAMPLE PERCENT	1.33
CO2 BACKGRD METER READING/SCALE	3.9/ 3
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	38.0/ 2
NOX SAMPLE PPM	38.0
NOX BACKGRD METER READING/SCALE	.4/ 2
NOX BACKGRD PPM	.4
HC CONCENTRATION PPM	726
CO CONCENTRATION PPM	2196
CO2 CONCENTRATION PCT	1.27
NOX CONCENTRATION PPM	37.6
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	34.68
CO MASS (GRAMS)	207.12
CO2 MASS (GRAMS)	1932.01
NOX MASS (GRAMS)	5.61
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	18.74 (30.16)	
CO GRAMS/KM (GRAMS/MILE)	111.94 (180.11)	
CO2 GRAMS/KM (GRAMS/MILE)	1044 (1680)	
NOX GRAMS/KM (GRAMS/MILE)	3.14 (5.05)	
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)	
HC GRAMS/KG OF FUEL 46.93	HC GRAMS/MIN	7.18
CO GRAMS/KG OF FUEL 277.3	CO GRAMS/MIN	42.9
CO2 GRAMS/KG OF FUEL 2587	CO2 GRAMS/MIN	400
NOX GRAMS/KG OF FUEL 7.78	NOX GRAMS/MIN	1.20
SO2 GRAMS/KG OF FUEL 0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 54.61 (4.31)

TOTAL CVS FLOW= 83.0STD. CU. METRES

TABLE F-4. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/11/78	TIME -0 HRS.	TEST NO. 3
MODEL 1975 CHEV C-60 ECS	RUN-3 BAG-2 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 19 C	DRY BULB TEMP 28 C	REL. HUM. 42.6 PCT
SPEC. HUM. 10.1 GRAM/KG	BARO. 742.4 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 5.390 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	9.99 MINUTES
BLOWER INLET PRESS.	406.4 MM. H2O
BLOWER DIF. PRESS.	457.2 MM H2O
BLOWER INLET TEMP.	82 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5081
BLOWER CU. CM /REV.	16966

BAG RESULTS

HC SAMPLE METER READING/SCALE	9.7/ 3
HC SAMPLE PPM	97
HC BACKGRD METER READING/SCALE	2.2/ 3
HC BACKGRD PPM	22
CO SAMPLE METER READING/SCALE	55.6/ 3
CO SAMPLE PPM	1382
CO BACKGRD METER READING/SCALE	.5/ 3
CO BACKGRD PPM	11
CO2 SAMPLE METER READING/SCALE	83.1/ 2
CO2 SAMPLE PERCENT	9.42
CO2 BACKGRD METER READING/SCALE	1.5/ 2
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	82.3/ 3
NOX SAMPLE PPM	296.9
NOX BACKGRD METER READING/SCALE	.9/ 3
NOX BACKGRD PPM	1.2
HC CONCENTRATION PPM	82
CO CONCENTRATION PPM	1238
CO2 CONCENTRATION PCT	9.38
NOX CONCENTRATION PPM	296.1
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	3.17
CO MASS (GRAMS)	96.09
CO2 MASS (GRAMS)	5350.30
NOX MASS (GRAMS)	30.79
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	.59 (	.95)
CO GRAMS/KM (GRAMS/MILE)	17.83 (	28.68)
CO2 GRAMS/KM (GRAMS/MILE)	993 (	1597)
NOX GRAMS/KM (GRAMS/MILE)	5.71 (	9.19)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (	0.00)

HC GRAMS/KG OF FUEL	1.82	HC GRAMS/MIN	.71
CO GRAMS/KG OF FUEL	55.3	CO GRAMS/MIN	21.4
CO2 GRAMS/KG OF FUEL	3077	CO2 GRAMS/MIN	1191
NOX GRAMS/KG OF FUEL	17.71	NOX GRAMS/MIN	6.85
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 43.64 (5.39)

TOTAL CVS FLOW= 66.7STD. CU. METRES

TABLE F-5. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/11/78	TIME -0 HRS.	TEST NO. 3
MODEL 1975 CHEV C-60 ECS	RUN-3 BAG-3 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 19 C	DRY BULB TEMP 32 C	REL. HUM. 28.5 PCT
SPEC. HUM. 8.9 GRAM/KG	BARO. 742.9 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 1.850 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	9.76 MINUTES
BLOWER INLET PRESS.	330.2 MM. H2O
BLOWER DIF. PRESS.	381.0 MM H2O
BLOWER INLET TEMP.	68 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5909
BLOWER CU. CM /REV.	17050

BAG RESULTS

HC SAMPLE METER READING/SCALE	19.3/ 3
HC SAMPLE PPM	193
HC BACKGRD METER READING/SCALE	1.8/ 3
HC BACKGRD PPM	18
CO SAMPLE METER READING/SCALE	75.6/11
CO SAMPLE PPM	335
CO BACKGRD METER READING/SCALE	.9/11
CO BACKGRD PPM	3
CO2 SAMPLE METER READING/SCALE	67.1/ 3
CO2 SAMPLE PERCENT	1.21
CO2 BACKGRD METER READING/SCALE	3.9/ 3
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	38.9/ 2
NOX SAMPLE PPM	38.9
NOX BACKGRD METER READING/SCALE	.9/ 2
NOX BACKGRD PPM	.9
HC CONCENTRATION PPM	177
CO CONCENTRATION PPM	322
CO2 CONCENTRATION PCT	1.15
NOX CONCENTRATION PPM	38.1
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	7.62
CO MASS (GRAMS)	28.03
CO2 MASS (GRAMS)	1576.93
NOX MASS (GRAMS)	5.07
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	4.12 (6.63)		
CO GRAMS/KM (GRAMS/MILE)	15.15 (24.38)		
CO2 GRAMS/KM (GRAMS/MILE)	852 (1371)		
NOX GRAMS/KM (GRAMS/MILE)	2.74 (4.41)		
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)		
HC GRAMS/KG OF FUEL	14.69	HC GRAMS/MIN	1.60
CO GRAMS/KG OF FUEL	54.0	CO GRAMS/MIN	5.9
CO2 GRAMS/KG OF FUEL	3038	CO2 GRAMS/MIN	331
NOX GRAMS/KG OF FUEL	9.77	NOX GRAMS/MIN	1.07
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 37.95 (6.20)

TOTAL CVS FLOW= 74.4STD. CU. METRES

TABLE F-6. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/11/78	TIME -0 HRS.	TEST NO. 3
MODEL 1975 CHEV C-60 ECS	RUN-3 BAG-4 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 19 C	DRY BULB TEMP 35 C	REL. HUM. 21.7 PCT
SPEC. HUM. 7.7 GRAM/KG	BARO. 742.4 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 5.406 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.49 MINUTES
BLOWER INLET PRESS.	381.0 MM. H2O
BLOWER DIF. PRESS.	431.8 MM H2O
BLOWER INLET TEMP.	87 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5081
BLOWER CU. CM /REV.	16983

BAG RESULTS

HC SAMPLE METER READING/SCALE	85.5/ 2
HC SAMPLE PPM	85
HC BACKGRD METER READING/SCALE	13.0/ 2
HC BACKGRD PPM	13
CO SAMPLE METER READING/SCALE	66.6/ 3
CO SAMPLE PPM	1713
CO BACKGRD METER READING/SCALE	.2/ 3
CO BACKGRD PPM	5
CO2 SAMPLE METER READING/SCALE	81.9/ 2
CO2 SAMPLE PERCENT	4.33
CO2 BACKGRD METER READING/SCALE	1.6/ 2
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	74.5/ 3
NOX SAMPLE PPM	223.5
NOX BACKGRD METER READING/SCALE	.4/ 3
NOX BACKGRD PPM	1.2
HC CONCENTRATION PPM	77
CO CONCENTRATION PPM	1555
CO2 CONCENTRATION PCT	4.29
NOX CONCENTRATION PPM	222.7
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	2.92
CO MASS (GRAMS)	119.31
CO2 MASS (GRAMS)	5179.81
NOX MASS (GRAMS)	25.57
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	.54 (	.87)
CO GRAMS/KM (GRAMS/MILE)	22.07 (	35.51)
CO2 GRAMS/KM (GRAMS/MILE)	958 (	1542)
NOX GRAMS/KM (GRAMS/MILE)	4.73 (	7.61)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (	0.00)

HC GRAMS/KG OF FUEL	1.72	HC GRAMS/MIN	.65
CO GRAMS/KG OF FUEL	70.3	CO GRAMS/MIN	26.6
CO2 GRAMS/KG OF FUEL	3053	CO2 GRAMS/MIN	1154
NOX GRAMS/KG OF FUEL	15.07	NOX GRAMS/MIN	5.70
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 42.95 (5.54)

TOTAL CVS FLOW 45.9STD. CU. METRES

TABLE F-7. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/11/78	TIME -0 HRS.	TEST NO. 3
MODEL 1975 CHEV C-60 ECS	RUN-3 BAG-S 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 18 C	DRY BULB TEMP 32 C	REL. HUM. 22.3 PCT
SPEC. HUM. 6.8 GRAM/KG	BARO. 742.4 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE .853 KM	FUEL 738.2 G/LITRE	FUEL MC RATIO 1.860

RUN DURATION	9.30 MINUTES
BLOWER INLET PRESS.	381.0 MM. H2O
BLOWER DIF. PRESS.	931.8 MM H2O
BLOWER INLET TEMP.	82 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	9892
BLOWER CU. CM /REV.	16992

BAG RESULTS

HC SAMPLE METER READING/SCALE	24.1/ 3
HC SAMPLE PPM	241
HC BACKGRD METER READING/SCALE	1.8/ 3
HC BACKGRD PPM	18
CO SAMPLE METER READING/SCALE	60.9/11
CO SAMPLE PPM	242
CO BACKGRD METER READING/SCALE	1.1/11
CO BACKGRD PPM	3
CO2 SAMPLE METER READING/SCALE	50.9/ 3
CO2 SAMPLE PERCENT	.87
CO2 BACKGRD METER READING/SCALE	9.0/ 3
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	91.5/ 2
NOX SAMPLE PPM	91.5
NOX BACKGRD METER READING/SCALE	.9/ 2
NOX BACKGRD PPM	.9
HC CONCENTRATION PPM	224
CO CONCENTRATION PPM	233
CO2 CONCENTRATION PCT	.82
NOX CONCENTRATION PPM	90.7
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	8.34
CO MASS (GRAMS)	17.52
CO2 MASS (GRAMS)	965.16
NOX MASS (GRAMS)	4.44
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	9.78	(15.73)
CO GRAMS/KM (GRAMS/MILE)	20.55	(33.06)
CO2 GRAMS/KM (GRAMS/MILE)	1132	(1821)
NOX GRAMS/KM (GRAMS/MILE)	5.21	(8.38)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	25.92	HC GRAMS/MIN	1.94
CO GRAMS/KG OF FUEL	54.5	CO GRAMS/MIN	4.1
CO2 GRAMS/KG OF FUEL	3002	CO2 GRAMS/MIN	224
NOX GRAMS/KG OF FUEL	13.81	NOX GRAMS/MIN	1.03
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 51.01 (4.61)

TOTAL CVS FLOW= 64.55TO. CU. METRES

TABLE F-8. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/11/78	TIME -0 HRS.	TEST NO. 3
MODEL 1975 CHEV C-60 ECS	RUN-3 BAG-6 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 16 C	DRY BULB TEMP 30 C	REL. HUM. 19.0 PCT
SPEC. HUM. 5.1 GRAM/KG	BARO. 742.9 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 3.379 KM	FUEL 738.2 G/LITRE	FUEL MC RATIO 1.860

RUN DURATION	9.62	MINUTES
BLOWER INLET PRESS.	330.2	MM. H20
BLOWER DIF. PRESS.	381.0	MM H20
BLOWER INLET TEMP.	68	DEG. C
DYNO REVOLUTIONS	-0	
BLOWER REVOLUTIONS	5234	
BLOWER CU. CM /REV.	17048	

BAG RESULTS

HC SAMPLE METER READING/SCALE	11.9/ 3	
HC SAMPLE PPM	119	
HC BACKGRD METER READING/SCALE	1.6/ 3	
HC BACKGRD PPM	16	
CO SAMPLE METER READING/SCALE	89.9/11	
CO SAMPLE PPM	399	
CO BACKGRD METER READING/SCALE	1.1/11	
CO BACKGRD PPM	3	
CO2 SAMPLE METER READING/SCALE	98.2/ 2	
CO2 SAMPLE PERCENT	2.18	
CO2 BACKGRD METER READING/SCALE	1.5/ 2	
CO2 BACKGRD PERCENT	.05	
NOX SAMPLE METER READING/SCALE	92.9/ 3	
NOX SAMPLE PPM	128.9	
NOX BACKGRD METER READING/SCALE	.3/ 3	
NOX BACKGRD PPM	.9	
HC CONCENTRATION PPM	101	
CO CONCENTRATION PPM	377	
CO2 CONCENTRATION PCT	2.14	
NOX CONCENTRATION PPM	127.9	
SO2 CONCENTRATION PPM	0.0	
HC MASS (GRAMS)	9.20	
CO MASS (GRAMS)	31.80	
CO2 MASS (GRAMS)	2831.13	
NOX MASS (GRAMS)	14.95	
SO2 MASS (GRAMS)	0.00	

HC GRAMS/KM (GRAMS/MILE)	1.24 (	2.00)
CO GRAMS/KM (GRAMS/MILE)	9.41 (	15.14)
CO2 GRAMS/KM (GRAMS/MILE)	838 (	1348)
NOX GRAMS/KM (GRAMS/MILE)	4.42 (	7.12)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (	0.00)

HC GRAMS/KG OF FUEL	4.60	HC GRAMS/MIN	.91
CO GRAMS/KG OF FUEL	34.8	CO GRAMS/MIN	6.9
CO2 GRAMS/KG OF FUEL	3100	CO2 GRAMS/MIN	613
NOX GRAMS/KG OF FUEL	16.37	NOX GRAMS/MIN	3.24
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 36.56 (6.43)

TOTAL CVS FLOW 72.48STD. CU. METRES

TABLE F-9. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/11/78
MODEL 1975 CHEV C-60 ECS
DRIVER KEN
WET BULB TEMP 14 C
SPEC. HUM. 6.4 GRAM/KG
DISTANCE 1.850 KM

TIME -0 HRS.
RUN-3 BAG-2 21C
TEST WT. 7711 KG.
DRY BULB TEMP 24 C
BARO. 742.4 MM HG.
FUEL 738.2 G/LITRE

TEST NO. 3
ENGINE 5.7 LITREV 8
GVW 0 KG
REL. HUM. 34.3 PCT
MEASURED FUEL 0.00 KG
FUEL HC RATIO 1.860

RUN DURATION	9.78 MINUTES
BLOWER INLET PRESS.	368.3 MM. H2O
BLOWER DIF. PRESS.	406.4 MM H2O
BLOWER INLET TEMP.	35 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5416
BLOWER CU. CM /REV.	16489

BAG RESULTS

HC SAMPLE METER READING/SCALE	26.3/ 3
HC SAMPLE PPM	263
HC BACKGRD METER READING/SCALE	1.9/ 3
HC BACKGRD PPM	19
CO SAMPLE METER READING/SCALE	91.8/11
CO SAMPLE PPM	961
CO BACKGRD METER READING/SCALE	.6/11
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	63.3/ 3
CO2 SAMPLE PERCENT	1.13
CO2 BACKGRD METER READING/SCALE	3.9/ 3
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	91.7/ 2
NOX SAMPLE PPM	91.7
NOX BACKGRD METER READING/SCALE	.5/ 2
NOX BACKGRD PPM	.5
HC CONCENTRATION PPM	246
CO CONCENTRATION PPM	944
CO2 CONCENTRATION PCT	1.08
NOX CONCENTRATION PPM	91.2
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	11.61
CO MASS (GRAMS)	92.35
CO2 MASS (GRAMS)	1621.89
NOX MASS (GRAMS)	5.67
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	6.27	(10.09)
CO GRAMS/KM (GRAMS/MILE)	22.89	(36.83)
CO2 GRAMS/KM (GRAMS/MILE)	877	(1410)
NOX GRAMS/KM (GRAMS/MILE)	3.06	(4.93)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	21.32	HC GRAMS/MIN	2.93
CO GRAMS/KG OF FUEL	77.8	CO GRAMS/MIN	8.9
CO2 GRAMS/KG OF FUEL	2980	CO2 GRAMS/MIN	339
NOX GRAMS/KG OF FUEL	10.41	NOX GRAMS/MIN	1.19
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 39.79 (5.91)

TOTAL CVS FLOW= 82.0STD. CU. METRES

TABLE F-10. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/11/78	TIME -0 HRS.	TEST NO. 3
MODEL 1975 CHEV C-60 FCS	RUN-3 BAG-B 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 16 C	DRY BULB TEMP 26 C	REL. HUM. 33.7 PCT
SPEC. HUM. 7.0 GRAM/KG	BARO. 742.4 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 5.390 KM	FUEL 738.2 G/LITRE	FUEL MC RATIO 1.860

RUN DURATION	9.98	MINUTES
BLOWER INLET PRESS.	393.7	MM. H2O
BLOWER DIF. PRESS.	931.8	MM H2O
BLOWER INLET TEMP.	76	DEG. C
DYNO REVOLUTIONS	-0	
BLOWER REVOLUTIONS	5060	
BLOWER CU. CM /REV.	16992	

BAG RESULTS

HC SAMPLE METER READING/SCALE	9.9/ 3
HC SAMPLE PPM	99
HC BACKGRD METER READING/SCALE	1.5/ 3
HC BACKGRD PPM	15
CO SAMPLE METER READING/SCALE	55.1/ 3
CO SAMPLE PPM	1367
CO BACKGRD METER READING/SCALE	.9/ 3
CO BACKGRD PPM	9
CO2 SAMPLE METER READING/SCALE	80.2/ 2
CO2 SAMPLE PERCENT	4.21
CO2 BACKGRD METER READING/SCALE	1.8/ 2
CO2 BACKGRD PERCENT	.07
NOX SAMPLE METER READING/SCALE	77.5/ 3
NOX SAMPLE PPM	232.5
NOX BACKGRD METER READING/SCALE	.4/ 3
NOX BACKGRD PPM	1.2
HC CONCENTRATION PPM	89
CO CONCENTRATION PPM	1235
CO2 CONCENTRATION PCT	4.17
NOX CONCENTRATION PPM	231.7
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	3.97
CO MASS (GRAMS)	97.31
CO2 MASS (GRAMS)	5161.16
NOX MASS (GRAMS)	26.70
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	.69	(1.03)
CO GRAMS/KM (GRAMS/MILE)	18.05	(29.05)
CO2 GRAMS/KM (GRAMS/MILE)	958	(1541)
NOX GRAMS/KM (GRAMS/MILE)	4.95	(7.97)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	2.06	HC GRAMS/MIN	.77
CO GRAMS/KG OF FUEL	57.9	CO GRAMS/MIN	21.7
CO2 GRAMS/KG OF FUEL	3072	CO2 GRAMS/MIN	1152
NOX GRAMS/KG OF FUEL	15.89	NOX GRAMS/MIN	5.96
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 42.17 (5.58)

TOTAL CVS FLOW= 67.7STD. CU. METRES

TABLE F-11. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/12/78	TIME -0 HRS.	TEST NO. 3
MODEL 1975 CHEV C-60 ECS	RUN-9 BAG-1 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 13 C	DRY BULB TEMP 23 C	REL. HUM. 32.6 PCT
SPEC. HUM. 5.7 GRAM/KG	BARO. 741.2 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 1.834 KM	FUEL 738.2 G/LITRE	FUEL MC RATIO 1.860

RUN DURATION	9.80 MINUTES
BLOWER INLET PRESS.	378.5 MM. H20
BLOWER DIF. PRESS.	919.0 MM H20
BLOWER INLET TEMP.	31 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5938
BLOWER CU. CM /REV.	16829

BAG RESULTS

HC SAMPLE METER READING/SCALE	62.9/ 3
HC SAMPLE PPM	629
HC BACKGRD METER READING/SCALE	1.8/ 3
HC BACKGRD PPM	18
CO SAMPLE METER READING/SCALE	73.3/ 3
CO SAMPLE PPM	1930
CO BACKGRD METER READING/SCALE	.1/ 3
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	71.1/ 3
CO2 SAMPLE PERCENT	1.29
CO2 BACKGRD METER READING/SCALE	3.7/ 3
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	90.6/ 2
NOX SAMPLE PPM	90.6
NOX BACKGRD METER READING/SCALE	.6/ 2
NOX BACKGRD PPM	.6
HC CONCENTRATION PPM	613
CO CONCENTRATION PPM	1860
CO2 CONCENTRATION PCT	1.29
NOX CONCENTRATION PPM	90.1
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	29.25
CO MASS (GRAMS)	179.17
CO2 MASS (GRAMS)	1873.02
NOX MASS (GRAMS)	5.95
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	15.95 (25.66)
CO GRAMS/KM (GRAMS/MILE)	97.68 (157.17)
CO2 GRAMS/KM (GRAMS/MILE)	1021 (1643)
NOX GRAMS/KM (GRAMS/MILE)	2.97 (4.78)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)

HC GRAMS/KG OF FUEL	41.25	HC GRAMS/MIN	6.10
CO GRAMS/KG OF FUEL	252.7	CO GRAMS/MIN	37.9
CO2 GRAMS/KG OF FUEL	2642	CO2 GRAMS/MIN	390
NOX GRAMS/KG OF FUEL	7.68	NOX GRAMS/MIN	1.19
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 52.29 (4.50)

TOTAL CVS FLOW= 82.8310. CU. METRES

TABLE F-12. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/12/78	TIME -0 HRS.	TEST NO. 3
MODEL 1975 CHEV C-60 ECS	RUN-4 BAG-2 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7211 KG.	GVW 0 KG
WET BULB TEMP 13 C	DRY BULB TEMP 23 C	REL. HUM. 30.3 PCT
SPEC. HUM. 5.5 GRAM/KG	BARO. 741.2 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 5.342 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	9.21 MINUTES
BLOWER INLET PRESS.	401.3 MM. H20
BLOWER DIF. PRESS.	434.3 MM H20
BLOWER INLET TEMP.	82 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	4762
BLOWER CU. CM /REV.	16985

BAG RESULTS

HC SAMPLE METER READING/SCALE	66.9/ 2
HC SAMPLE PPM	67
HC BACKGRD METER READING/SCALE	18.6/ 2
HC BACKGRD PPM	19
CO SAMPLE METER READING/SCALE	99.1/ 3
CO SAMPLE PPM	1198
CO BACKGRD METER READING/SCALE	.1/ 3
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	86.9/ 2
CO2 SAMPLE PERCENT	9.70
CO2 BACKGRD METER READING/SCALE	1.8/ 2
CO2 BACKGRD PERCENT	.07
NOX SAMPLE METER READING/SCALE	91.5/ 3
NOX SAMPLE PPM	274.5
NOX BACKGRD METER READING/SCALE	.4/ 3
NOX BACKGRD PPM	1.2
HC CONCENTRATION PPM	55
CO CONCENTRATION PPM	1077
CO2 CONCENTRATION PCT	9.65
NOX CONCENTRATION PPM	273.7
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	1.98
CO MASS (GRAMS)	78.91
CO2 MASS (GRAMS)	5329.60
NOX MASS (GRAMS)	27.95
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	.37	(.60)
CO GRAMS/KM (GRAMS/MILE)	14.68	(23.62)
CO2 GRAMS/KM (GRAMS/MILE)	998	(1605)
NOX GRAMS/KM (GRAMS/MILE)	5.23	(8.42)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	1.15	HC GRAMS/MIN	.97
CO GRAMS/KG OF FUEL	45.5	CO GRAMS/MIN	18.6
CO2 GRAMS/KG OF FUEL	3099	CO2 GRAMS/MIN	1265
NOX GRAMS/KG OF FUEL	16.23	NOX GRAMS/MIN	6.64
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 43.62 (5.39)

TOTAL CVS FLOW 62.6STD. CU. METRES

TABLE F-13. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/12/78	TIME -0 HRS.	TEST NO. 3
MODEL 1975 CHEV C-60 ECS	RUN-# BAG-3 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 14 C	DRY BULB TEMP 24 C	REL. HUM. 31.2 PCT
SPEC. HUM. 5.9 GRAM/KG	BARO. 741.2 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 1.850 KM	FUEL 739.2 G/LITRE	FUEL MC RATIO 1.860

RUN DURATION	9.76 MINUTES
BLOWER INLET PRESS.	320.0 MM. H20
BLOWER DIF. PRESS.	355.6 MM H20
BLOWER INLET TEMP.	32 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5929
BLOWER CU. CM /REV.	17070

BAG RESULTS

HC SAMPLE METER READING/SCALE	16.7/ 3
HC SAMPLE PPM	167
HC BACKGRD METER READING/SCALE	1.7/ 3
HC BACKGRD PPM	17
CO SAMPLE METER READING/SCALE	76.9/11
CO SAMPLE PPM	391
CO BACKGRD METER READING/SCALE	.3/11
CO BACKGRD PPM	1
CO2 SAMPLE METER READING/SCALE	67.9/ 3
CO2 SAMPLE PERCENT	1.22
CO2 BACKGRD METER READING/SCALE	3.9/ 3
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	91.2/ 2
NOX SAMPLE PPM	91.2
NOX BACKGRD METER READING/SCALE	.8/ 2
NOX BACKGRD PPM	.8
HC CONCENTRATION PPM	152
CO CONCENTRATION PPM	328
CO2 CONCENTRATION PCT	1.17
NOX CONCENTRATION PPM	90.5
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	6.99
CO MASS (GRAMS)	28.90
CO2 MASS (GRAMS)	1597.39
NOX MASS (GRAMS)	9.96
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	3.51 (	5.65)
CO GRAMS/KM (GRAMS/MILE)	15.35 (	24.69)
CO2 GRAMS/KM (GRAMS/MILE)	863 (	1389)
NOX GRAMS/KM (GRAMS/MILE)	5.68 (	9.31)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (	0.00)

HC GRAMS/KG OF FUEL	10.38	HC GRAMS/MIN	1.36
CO GRAMS/KG OF FUEL	59.1	CO GRAMS/MIN	6.0
CO2 GRAMS/KG OF FUEL	3045	CO2 GRAMS/MIN	335
NOX GRAMS/KG OF FUEL	9.45	NOX GRAMS/MIN	1.09
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 38.35 (6.13)

TOTAL CVS FLOW 29.33TD. CU. METRES

TABLE F-14. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/12/78	TIME -0 HRS.	TEST NO. 3
MODEL 1975 CHEV C-60 ECS	RUN-4 BAG-4 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 14 C	DRY BULB TEMP 24 C	REL. HUM. 29.0 PCT
SPEC. HUM. 5.6 GRAM/KG	BARO. 741.2 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 5.906 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.49	MINUTES
BLOWER INLET PRESS.	393.7	MM. H2O
BLOWER DIF. PRESS.	426.7	MM H2O
BLOWER INLET TEMP.	87	DEG. C
DYNO REVOLUTIONS	-0	
BLOWER REVOLUTIONS	5090	
BLOWER CU. CM /REV.	16987	

BAG RESULTS

HC SAMPLE METER READING/SCALE	92.4/ 2
HC SAMPLE PPM	92
HC BACKGRD METER READING/SCALE	16.4/ 2
HC BACKGRD PPM	16
CO SAMPLE METER READING/SCALE	67.8/ 3
CO SAMPLE PPM	1751
CO BACKGRD METER READING/SCALE	.2/ 3
CO BACKGRD PPM	5
CO2 SAMPLE METER READING/SCALE	80.4/ 2
CO2 SAMPLE PERCENT	4.22
CO2 BACKGRD METER READING/SCALE	1.8/ 2
CO2 BACKGRD PERCENT	.07
NOX SAMPLE METER READING/SCALE	68.4/ 3
NOX SAMPLE PPM	206.7
NOX BACKGRD METER READING/SCALE	.5/ 3
NOX BACKGRD PPM	1.5
HC CONCENTRATION PPM	81
CO CONCENTRATION PPM	1589
CO2 CONCENTRATION PCT	4.18
NOX CONCENTRATION PPM	205.7
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	3.09
CO MASS (GRAMS)	121.79
CO2 MASS (GRAMS)	5038.81
NOX MASS (GRAMS)	22.18
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	.57	(.92)
CO GRAMS/KM (GRAMS/MILE)	22.53	(36.25)
CO2 GRAMS/KM (GRAMS/MILE)	932	(1500)
NOX GRAMS/KM (GRAMS/MILE)	4.10	(6.60)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	1.87	HC GRAMS/MIN	.69
CO GRAMS/KG OF FUEL	73.7	CO GRAMS/MIN	27.1
CO2 GRAMS/KG OF FUEL	3048	CO2 GRAMS/MIN	1122
NOX GRAMS/KG OF FUEL	13.42	NOX GRAMS/MIN	4.94
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 41.37 (5.69)

TOTAL CVS FLOW= 65.9STD. CU. METRES

TABLE F-15. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/12/78	TIME -0 HRS.	TEST NO. 3
MODEL 1975 CHEV C-60 ECS	RUN-4 BAG-5 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 14 C	DRY BULB TEMP 25 C	REL. HUM. 29.8 PCT
SPEC. HUM. 6.0 GRAM/KG	BARO. 741.2 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE .869 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.24	MINUTES
BLOWER INLET PRESS.	317.5	MM. H2O
BLOWER DIF. PRESS.	350.5	MM H2O
BLOWER INLET TEMP.	73	DEG. C
DYNO REVOLUTIONS	-0	
BLOWER REVOLUTIONS	4848	
BLOWER CU. CM /REV.	17075	

BAG RESULTS

HC SAMPLE METER READING/SCALE	22.4/ 3
HC SAMPLE PPM	224
HC BACKGRD METER READING/SCALE	1.9/ 3
HC BACKGRD PPM	19
CO SAMPLE METER READING/SCALE	65.8/11
CO SAMPLE PPM	273
CO BACKGRD METER READING/SCALE	.8/11
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	48.1/ 3
CO2 SAMPLE PERCENT	.83
CO2 BACKGRD METER READING/SCALE	3.5/ 3
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	35.5/ 2
NOX SAMPLE PPM	35.5
NOX BACKGRD METER READING/SCALE	.9/ 2
NOX BACKGRD PPM	.9
HC CONCENTRATION PPM	206
CO CONCENTRATION PPM	264
CO2 CONCENTRATION PCT	.78
NOX CONCENTRATION PPM	34.7
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	7.86
CO MASS (GRAMS)	20.29
CO2 MASS (GRAMS)	943.97
NOX MASS (GRAMS)	3.79
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	9.04	(14.55)
CO GRAMS/KM (GRAMS/MILE)	23.35	(37.57)
CO2 GRAMS/KM (GRAMS/MILE)	1086	(1748)
NOX GRAMS/KM (GRAMS/MILE)	4.36	(7.02)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	24.88	HC GRAMS/MIN	1.85
CO GRAMS/KG OF FUEL	64.3	CO GRAMS/MIN	4.8
CO2 GRAMS/KG OF FUEL	2990	CO2 GRAMS/MIN	223
NOX GRAMS/KG OF FUEL	12.00	NOX GRAMS/MIN	.89
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 49.16 (4.79)

TOTAL CVS FLOW= 66.1STD. CU. METRES

TABLE F-16. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/12/78	TIME -0 HRS.	TEST NO. 3
MODEL 1975 CHEV C-60 ECS	RUN-4 BAG-6 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 15 C	DRY BULB TEMP 26 C	REL. HUM. 30.7 PCT
SPEC. HUM. 6.4 GRAM/KG	BARO. 740.9 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 3.379 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.67 MINUTES
BLOWER INLET PRESS.	388.6 MM. H2O
BLOWER DIF. PRESS.	424.2 MM H2O
BLOWER INLET TEMP.	65 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5292
BLOWER CU. CM /REV.	17012

BAG RESULTS

HC SAMPLE METER READING/SCALE	12.7/ 3
HC SAMPLE PPM	127
HC BACKGRD METER READING/SCALE	1.7/ 3
HC BACKGRD PPM	17
CO SAMPLE METER READING/SCALE	90.8/11
CO SAMPLE PPM	452
CO BACKGRD METER READING/SCALE	.9/11
CO BACKGRD PPM	3
CO2 SAMPLE METER READING/SCALE	46.9/ 2
CO2 SAMPLE PERCENT	2.11
CO2 BACKGRD METER READING/SCALE	1.6/ 2
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	37.8/ 3
NOX SAMPLE PPM	113.4
NOX BACKGRD METER READING/SCALE	.3/ 3
NOX BACKGRD PPM	.9
HC CONCENTRATION PPM	113
CO CONCENTRATION PPM	427
CO2 CONCENTRATION PCT	2.06
NOX CONCENTRATION PPM	112.6
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	4.75
CO MASS (GRAMS)	36.31
CO2 MASS (GRAMS)	2755.64
NOX MASS (GRAMS)	13.77
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	1.41 (	2.26)
CO GRAMS/KM (GRAMS/MILE)	10.75 (	17.29)
CO2 GRAMS/KM (GRAMS/MILE)	816 (	1312)
NOX GRAMS/KM (GRAMS/MILE)	4.08 (	6.56)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (	0.00)

HC GRAMS/KG OF FUEL	5.32	HC GRAMS/MIN	1.02
CO GRAMS/KG OF FUEL	40.7	CO GRAMS/MIN	7.8
CO2 GRAMS/KG OF FUEL	3089	CO2 GRAMS/MIN	590
NOX GRAMS/KG OF FUEL	15.44	NOX GRAMS/MIN	2.95
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 35.72 (6.59)

TOTAL CVS FLOW= 73.1STD. CU. METRES

TABLE F-17. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/12/78	TIME -0 HRS.	TEST NO. 3
MODEL 1975 CHEV C-60 ECS	RUN-4 BAG-7 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 15 C	DRY BULB TEMP 26 C	REL. HUM. 30.7 PCT
SPEC. HUM. 6.4 GRAM/KG	BARO. 740.9 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 1.834 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.84	MINUTES
BLOWER INLET PRESS.	370.8	MM. H20
BLOWER DIF. PRESS.	411.5	MM H20
BLOWER INLET TEMP.	33	DEG. C
DYNO REVOLUTIONS	-0	
BLOWER REVOLUTIONS	5508	
BLOWER CU. CM /REV.	16862	

BAG RESULTS

HC SAMPLE METER READING/SCALE	32.4/ 3
HC SAMPLE PPM	324
HC BACKGRD METER READING/SCALE	1.9/ 3
HC BACKGRD PPM	19
CO SAMPLE METER READING/SCALE	85.6/11
CO SAMPLE PPM	409
CO BACKGRD METER READING/SCALE	1.3/11
CO BACKGRD PPM	4
CO2 SAMPLE METER READING/SCALE	63.6/ 3
CO2 SAMPLE PERCENT	1.13
CO2 BACKGRD METER READING/SCALE	3.9/ 3
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	45.5/ 2
NOX SAMPLE PPM	45.5
NOX BACKGRD METER READING/SCALE	.6/ 2
NOX BACKGRD PPM	.6
HC CONCENTRATION PPM	307
CO CONCENTRATION PPM	392
CO2 CONCENTRATION PCT	1.08
NOX CONCENTRATION PPM	45.0
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	14.75
CO MASS (GRAMS)	38.09
CO2 MASS (GRAMS)	1650.21
NOX MASS (GRAMS)	6.28
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	8.04	(12.94)
CO GRAMS/KM (GRAMS/MILE)	20.77	(33.41)
CO2 GRAMS/KM (GRAMS/MILE)	900	(1448)
NOX GRAMS/KM (GRAMS/MILE)	3.42	(5.51)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	26.62	HC GRAMS/MIN	3.05
CO GRAMS/KG OF FUEL	68.7	CO GRAMS/MIN	7.9
CO2 GRAMS/KG OF FUEL	2977	CO2 GRAMS/MIN	341
NOX GRAMS/KG OF FUEL	11.32	NOX GRAMS/MIN	1.30
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 40.88 (5.75)

TOTAL CVS FLOW= 83.5STD. CU. METRES

TABLE F-18. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/12/78	TIME -0 HRS.	TEST NO. 3
MODEL 1975 CHEV C-60 ECS	RUN-9 BAG-8 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 15 C	DRY BULB TEMP 26 C	REL. HUM. 28.6 PCT
SPEC. HUM. 6.1 GRAM/KG	BARO. 740.9 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 5.906 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	9.97 MINUTES
BLOWER INLET PRESS.	398.8 MM. H20
BLOWER DIF. PRESS.	431.8 MM H20
BLOWER INLET TEMP.	76 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5056
BLOWER CU. CM /REV.	16992

BAG RESULTS

HC SAMPLE METER READING/SCALE	10.2/ 3
HC SAMPLE PPM	102
HC BACKGRD METER READING/SCALE	1.5/ 3
HC BACKGRD PPM	15
CO SAMPLE METER READING/SCALE	53.7/ 3
CO SAMPLE PPM	1327
CO BACKGRD METER READING/SCALE	.2/ 3
CO BACKGRD PPM	5
CO2 SAMPLE METER READING/SCALE	77.5/ 2
CO2 SAMPLE PERCENT	9.02
CO2 BACKGRD METER READING/SCALE	1.7/ 2
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	70.1/ 3
NOX SAMPLE PPM	210.3
NOX BACKGRD METER READING/SCALE	.9/ 3
NOX BACKGRD PPM	1.2
HC CONCENTRATION PPM	92
CO CONCENTRATION PPM	1209
CO2 CONCENTRATION PCT	3.98
NOX CONCENTRATION PPM	209.5
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	3.56
CO MASS (GRAMS)	99.90
CO2 MASS (GRAMS)	9910.87
NOX MASS (GRAMS)	23.98
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	.66 (	1.06)
CO GRAMS/KM (GRAMS/MILE)	17.55 (	28.24)
CO2 GRAMS/KM (GRAMS/MILE)	908 (	1462)
NOX GRAMS/KM (GRAMS/MILE)	4.34 (	6.99)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (	0.00)

HC GRAMS/KG OF FUEL	2.23	HC GRAMS/MIN	.80
CO GRAMS/KG OF FUEL	59.3	CO GRAMS/MIN	21.2
CO2 GRAMS/KG OF FUEL	3069	CO2 GRAMS/MIN	1098
NOX GRAMS/KG OF FUEL	14.67	NOX GRAMS/MIN	5.25
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 40.09 (5.88)

TOTAL CVS FLOW= 67.55TD. CU. METRES

TABLE F-19. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/13/78	TIME -0 HRS.	TEST NO. 4
MODEL 1975 CHEV C-60 ECS	RUN-3 BAG-1 21H	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 13 C	DRY BULB TEMP 22 C	REL. HUM. 37.7 PCT
SPEC. HUM. 6.2 GRAM/KG	BARO. 745.0 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 1.834 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.80 MINUTES
BLOWER INLET PRESS.	370.8 MM. H20
BLOWER DIF. PRESS.	403.4 MM H20
BLOWER INLET TEMP.	36 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5429
BLOWER CU. CM /REV.	16915

BAG RESULTS

HC SAMPLE METER READING/SCALE	32.3/ 3
HC SAMPLE PPM	323
HC BACKGRD METER READING/SCALE	1.8/ 3
HC BACKGRD PPM	18
CO SAMPLE METER READING/SCALE	92.4/11
CO SAMPLE PPM	966
CO BACKGRD METER READING/SCALE	.8/11
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	64.8/ 3
CO2 SAMPLE PERCENT	1.16
CO2 BACKGRD METER READING/SCALE	3.7/ 3
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	42.2/ 2
NOX SAMPLE PPM	42.2
NOX BACKGRD METER READING/SCALE	.8/ 2
NOX BACKGRD PPM	.8
HC CONCENTRATION PPM	307
CO CONCENTRATION PPM	948
CO2 CONCENTRATION PCT	1.11
NOX CONCENTRATION PPM	41.5
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	14.51
CO MASS (GRAMS)	42.80
CO2 MASS (GRAMS)	1663.93
NOX MASS (GRAMS)	5.66
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	7.91 (12.73)
CO GRAMS/KM (GRAMS/MILE)	23.33 (37.54)
CO2 GRAMS/KM (GRAMS/MILE)	907 (1460)
NOX GRAMS/KM (GRAMS/MILE)	3.09 (4.97)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)

HC GRAMS/KG OF FUEL	25.88	HC GRAMS/MIN	3.02
CO GRAMS/KG OF FUEL	76.3	CO GRAMS/MIN	8.9
CO2 GRAMS/KG OF FUEL	2967	CO2 GRAMS/MIN	347
NOX GRAMS/KG OF FUEL	10.10	NOX GRAMS/MIN	1.18
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 41.35 (5.69)

TOTAL CVS FLOW= 82.1STD. CU. METRES

TABLE F-20. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/13/78	TIME -0 HRS.	TEST NO. 4
MODEL 1975 CHEV C-60 ECS	RUN-3 BAG-2 21H	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 14 C	DRY BULB TEMP 23 C	REL. HUM. 35.9 PCT
SPEC. HUM. 6.3 GRAM/KG	BARO. 745.0 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 5.326 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.52 MINUTES
BLOWER INLET PRESS.	416.6 MM. H20
BLOWER DIF. PRESS.	449.6 MM H20
BLOWER INLET TEMP.	82 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5106
BLOWER CU. CM /REV.	16972

BAG RESULTS

HC SAMPLE METER READING/SCALE	10.3/ 3
HC SAMPLE PPM	103
HC BACKGRD METER READING/SCALE	1.7/ 3
HC BACKGRD PPM	17
CO SAMPLE METER READING/SCALE	70.9/ 3
CO SAMPLE PPM	1851
CO BACKGRD METER READING/SCALE	.1/ 3
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	81.9/ 2
CO2 SAMPLE PERCENT	4.30
CO2 BACKGRD METER READING/SCALE	1.6/ 2
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	83.9/ 3
NOX SAMPLE PPM	251.7
NOX BACKGRD METER READING/SCALE	.4/ 3
NOX BACKGRD PPM	1.2
HC CONCENTRATION PPM	92
CO CONCENTRATION PPM	1675
CO2 CONCENTRATION PCT	4.26
NOX CONCENTRATION PPM	250.4
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	3.55
CO MASS (GRAMS)	131.05
CO2 MASS (GRAMS)	5238.72
NOX MASS (GRAMS)	28.14
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	.67 (	1.07)
CO GRAMS/KM (GRAMS/MILE)	24.61 (	39.59)
CO2 GRAMS/KM (GRAMS/MILE)	984 (	1583)
NOX GRAMS/KM (GRAMS/MILE)	5.28 (	8.50)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (	0.00)

HC GRAMS/KG OF FUEL	2.06	HC GRAMS/MIN	.79
CO GRAMS/KG OF FUEL	76.1	CO GRAMS/MIN	29.0
CO2 GRAMS/KG OF FUEL	3043	CO2 GRAMS/MIN	1159
NOX GRAMS/KG OF FUEL	16.35	NOX GRAMS/MIN	6.23
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 43.72 (5.38)

TOTAL CVS FLOW= 67.2STD. CU. METRES

TABLE F-21. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/13/78	TIME -0 HRS.	TEST NO. 4
MODEL 1975 CHEV C-60 ECS	RUN-3 BAG-3 21M	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 15 C	DRY BULB TEMP 26 C	REL. HUM. 30.6 PCT
SPEC. HUM. 6.3 GRAM/KG	BARO. 744.7 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE .869 KM	FUEL 738.2 G/LITRE	FUEL MC RATIO 1.860

RUN DURATION	9.21	MINUTES
BLOWER INLET PRESS.	320.0	MM. H2O
BLOWER DIF. PRESS.	353.1	MM H2O
BLOWER INLET TEMP.	73	DEG. C
DYNO REVOLUTIONS	-0	
BLOWER REVOLUTIONS	9789	
BLOWER CU. CM /REV.	17071	

BAG RESULTS

HC SAMPLE METER READING/SCALE	31.9/ 3
HC SAMPLE PPM	319
HC BACKGRD METER READING/SCALE	2.1/ 3
HC BACKGRD PPM	21
CO SAMPLE METER READING/SCALE	89.3/11
CO SAMPLE PPM	398
CO BACKGRD METER READING/SCALE	.8/11
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	99.8/ 3
CO2 SAMPLE PERCENT	.86
CO2 BACKGRD METER READING/SCALE	3.9/ 3
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	37.9/ 2
NOX SAMPLE PPM	37.9
NOX BACKGRD METER READING/SCALE	1.0/ 2
NOX BACKGRD PPM	1.0
HC CONCENTRATION PPM	299
CO CONCENTRATION PPM	386
CO2 CONCENTRATION PCT	.81
NOX CONCENTRATION PPM	36.5
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	11.13
CO MASS (GRAMS)	29.93
CO2 MASS (GRAMS)	969.19
NOX MASS (GRAMS)	3.99
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	12.81 (	20.61)
CO GRAMS/KM (GRAMS/MILE)	33.87 (	54.50)
CO2 GRAMS/KM (GRAMS/MILE)	1115 (	1795)
NOX GRAMS/KM (GRAMS/MILE)	4.60 (	7.40)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (	0.00)

HC GRAMS/KG OF FUEL	33.57	HC GRAMS/MIN	2.69
CO GRAMS/KG OF FUEL	88.8	CO GRAMS/MIN	7.0
CO2 GRAMS/KG OF FUEL	2923	CO2 GRAMS/MIN	230
NOX GRAMS/KG OF FUEL	12.05	NOX GRAMS/MIN	.95
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 51.61 (4.56)

TOTAL CVS FLOW= 65.651D. CU. METRES

TABLE P-22. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/13/78	TIME -0 HRS.	TEST NO. 4
MODEL 1975 CHEV C-60 ECS	RUN-3 BAG-4 21M	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 16 C	DRY BULB TEMP 28 C	REL. HUM. 23.7 PCT
SPEC. HUM. 5.8 GRAM/KG	BARO. 744.7 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 3.374 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.67 MINUTES
BLOWER INLET PRESS.	370.8 MM. H2O
BLOWER DIF. PRESS.	406.4 MM H2O
BLOWER INLET TEMP.	65 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5287
BLOWER CU. CM /REV.	17028

BAG RESULTS

HC SAMPLE METER READING/SCALE	13.3/ 3
HC SAMPLE PPM	133
HC BACKGRD METER READING/SCALE	2.0/ 3
HC BACKGRD PPM	20
CO SAMPLE METER READING/SCALE	23.4/ 3
CO SAMPLE PPM	553
CO BACKGRD METER READING/SCALE	.1/ 3
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	44.2/ 2
CO2 SAMPLE PERCENT	2.24
CO2 BACKGRD METER READING/SCALE	1.3/ 2
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	39.8/ 3
NOX SAMPLE PPM	119.4
NOX BACKGRD METER READING/SCALE	.3/ 3
NOX BACKGRD PPM	.4
HC CONCENTRATION PPM	116
CO CONCENTRATION PPM	523
CO2 CONCENTRATION PCT	2.20
NOX CONCENTRATION PPM	118.7
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	4.44
CO MASS (GRAMS)	44.74
CO2 MASS (GRAMS)	2961.08
NOX MASS (GRAMS)	14.36
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	1.46	(2.35)
CO GRAMS/KM (GRAMS/MILE)	13.26	(21.33)
CO2 GRAMS/KM (GRAMS/MILE)	876	(1410)
NOX GRAMS/KM (GRAMS/MILE)	4.25	(6.84)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	5.14	HC GRAMS/MIN	1.06
CO GRAMS/KG OF FUEL	46.6	CO GRAMS/MIN	9.6
CO2 GRAMS/KG OF FUEL	3080	CO2 GRAMS/MIN	635
NOX GRAMS/KG OF FUEL	14.94	NOX GRAMS/MIN	3.08
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 38.44 (6.11)

TOTAL CVS FLOW= 93.685TO. CU. METRES

TABLE F-23. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/13/78	TIME -0 HRS.	TEST NO. 9
MODEL 1975 CHEV C-60 ECS	RUN-9 BAG-1 21M	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 16 C	DRY BULB TEMP 28 C	REL. HUM. 26.3 PCT
SPEC. HUM. 6.9 GRAM/KG	BARO. 799.7 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 1.850 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	9.76	MINUTES
BLOWER INLET PRESS.	363.2	MM. H2O
BLOWER DIF. PRESS.	398.8	MM H2O
BLOWER INLET TEMP.	38	DEG. C
DYNO REVOLUTIONS	-0	
BLOWER REVOLUTIONS	5378	
BLOWER CU. CM /REV.	16998	

BAG RESULTS

HC SAMPLE METER READING/SCALE	36.0/ 3
HC SAMPLE PPM	360
HC BACKGRD METER READING/SCALE	2.1/ 3
HC BACKGRD PPM	21
CO SAMPLE METER READING/SCALE	96.6/11
CO SAMPLE PPM	505
CO BACKGRD METER READING/SCALE	.7/11
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	63.7/ 3
CO2 SAMPLE PERCENT	1.14
CO2 BACKGRD METER READING/SCALE	3.9/ 3
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	92.9/ 2
NOX SAMPLE PPM	92.9
NOX BACKGRD METER READING/SCALE	.6/ 2
NOX BACKGRD PPM	.6
HC CONCENTRATION PPM	391
CO CONCENTRATION PPM	988
CO2 CONCENTRATION PCT	1.09
NOX CONCENTRATION PPM	91.9
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	15.91
CO MASS (GRAMS)	95.97
CO2 MASS (GRAMS)	1613.90
NOX MASS (GRAMS)	5.67
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	8.60	(13.83)
CO GRAMS/KM (GRAMS/MILE)	24.85	(39.98)
CO2 GRAMS/KM (GRAMS/MILE)	872	(1403)
NOX GRAMS/KM (GRAMS/MILE)	3.07	(4.93)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	29.03	HC GRAMS/MIN	3.39
CO GRAMS/KG OF FUEL	83.9	CO GRAMS/MIN	9.7
CO2 GRAMS/KG OF FUEL	2946	CO2 GRAMS/MIN	339
NOX GRAMS/KG OF FUEL	10.35	NOX GRAMS/MIN	1.19
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 40.06 (5.87)

TOTAL CVS FLOW= 81.0STD. CU. METRES

TABLE F-24. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/13/78	TIME -0 HRS.	TEST NO. 9
MODEL 1975 CHEV C-60 ECS	RUN-9 BAG-2 21H	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 16 C	DRY BULB TEMP 28 C	REL. HUM. 26.5 PCT
SPEC. HUM. 6.0 GRAM/KG	BARO. 744.7 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 5.390 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	9.99 MINUTES
BLOWER INLET PRESS.	901.3 MM. H20
BLOWER DIF. PRESS.	939.3 MM H20
BLOWER INLET TEMP.	76 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5077
BLOWER CU. CM /REV.	16992

BAG RESULTS

HC SAMPLE METER READING/SCALE	11.0/ 3
HC SAMPLE PPM	110
HC BACKGRD METER READING/SCALE	2.1/ 3
HC BACKGRD PPM	21
CO SAMPLE METER READING/SCALE	66.2/ 3
CO SAMPLE PPM	1700
CO BACKGRD METER READING/SCALE	.1/ 3
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	80.9/ 2
CO2 SAMPLE PERCENT	9.26
CO2 BACKGRD METER READING/SCALE	1.6/ 2
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	79.3/ 3
NOX SAMPLE PPM	222.9
NOX BACKGRD METER READING/SCALE	.9/ 3
NOX BACKGRD PPM	1.2
HC CONCENTRATION PPM	96
CO CONCENTRATION PPM	1596
CO2 CONCENTRATION PCT	9.22
NOX CONCENTRATION PPM	222.1
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	3.76
CO MASS (GRAMS)	122.99
CO2 MASS (GRAMS)	5259.93
NOX MASS (GRAMS)	25.03
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	.70 (	1.12)
CO GRAMS/KM (GRAMS/MILE)	22.71 (	36.55)
CO2 GRAMS/KM (GRAMS/MILE)	976 (	1570)
NOX GRAMS/KM (GRAMS/MILE)	4.64 (	7.47)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (	0.00)

HC GRAMS/KG OF FUEL	2.18	HC GRAMS/MIN	.84
CO GRAMS/KG OF FUEL	71.0	CO GRAMS/MIN	27.3
CO2 GRAMS/KG OF FUEL	3051	CO2 GRAMS/MIN	1172
NOX GRAMS/KG OF FUEL	14.52	NOX GRAMS/MIN	5.58
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 43.26 (5.44)

TOTAL CVS FLOW= 68.1STD. CU. METRES

TABLE F-25. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/13/78 | TIME -0 HRS. | TEST NO. 4
MODEL 1975 CHEV C-60 ECS | RUN-4 BAG-3 21M | ENGINE 5.7 LITREV 8
DRIVER KEN | TEST WT. 7711 KG. | GVW 0 KG
WET BULB TEMP 15 C | DRY BULB TEMP 27 C | REL. HUM. 29.6 PCT
SPEC. HUM. 5.6 GRAM/KG | BARO. 744.5 MM HG. | MEASURED FUEL 0.00 KG
DISTANCE .869 KM | FUEL 738.2 G/LITRE | FUEL MC RATIO 1.860

RUN DURATION	9.23 MINUTES
BLOWER INLET PRESS.	335.3 MM. H2O
BLOWER DIF. PRESS.	373.9 MM H2O
BLOWER INLET TEMP.	68 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	9802
BLOWER CU. CM /REV.	17055

BAG RESULTS

HC SAMPLE METER READING/SCALE	25.2/ 3
HC SAMPLE PPM	252
HC BACKGRD METER READING/SCALE	2.0/ 3
HC BACKGRD PPM	20
CO SAMPLE METER READING/SCALE	78.1/11
CO SAMPLE PPM	352
CO BACKGRD METER READING/SCALE	.5/11
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	50.0/ 3
CO2 SAMPLE PERCENT	.82
CO2 BACKGRD METER READING/SCALE	3.3/ 3
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	32.7/ 2
NOX SAMPLE PPM	32.7
NOX BACKGRD METER READING/SCALE	.9/ 2
NOX BACKGRD PPM	.9
HC CONCENTRATION PPM	233
CO CONCENTRATION PPM	342
CO2 CONCENTRATION PCT	.82
NOX CONCENTRATION PPM	31.9
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	8.95
CO MASS (GRAMS)	26.50
CO2 MASS (GRAMS)	996.38
NOX MASS (GRAMS)	3.47
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	10.30 (	16.57)
CO GRAMS/KM (GRAMS/MILE)	30.50 (	49.08)
CO2 GRAMS/KM (GRAMS/MILE)	1149 (	1849)
NOX GRAMS/KM (GRAMS/MILE)	3.99 (	6.43)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (	0.00)

HC GRAMS/KG OF FUEL	26.55	HC GRAMS/MIN	2.11
CO GRAMS/KG OF FUEL	78.6	CO GRAMS/MIN	6.3
CO2 GRAMS/KG OF FUEL	2962	CO2 GRAMS/MIN	236
NOX GRAMS/KG OF FUEL	10.29	NOX GRAMS/MIN	.82
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 52.98 (9.98)

TOTAL CVS FLOW= 66.5STD. CU. METRES

TABLE F-26. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 28

DATE 1/13/78	TIME -0 HRS.	TEST NO. 4
MODEL 1975 CHEV C-6H ECS	RUN-4 BAG-4 RIM	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 14 C	DRY BULB TEMP 27 C	REL. HUM. 22.0 PCT
SPEC. HUM. 5.0 GRAM/KG	BARO. 744.5 MM HG.	MEASURED FUEL 0.86 KG
DISTANCE 3.379 KM	FUEL 738.2 G/LITRE	FUEL MC RATIO 1.860

RUN DURATION	9.68 MINUTES
BLOWER INLET PRESS.	360.7 MM. H20
BLOWER DIF. PRESS.	396.2 MM H20
BLOWER INLET TEMP.	45 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5294
BLOWER CU. CM /REV.	17036

BAG RESULTS

HC SAMPLE METER READING/SCALE	19.1/ 3
HC SAMPLE PPM	191
HC BACKGRD METER READING/SCALE	1.7/ 3
HC BACKGRD PPM	17
CO SAMPLE METER READING/SCALE	27.1/ 3
CO SAMPLE PPM	630
CO BACKGRD METER READING/SCALE	.1/ 3
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	98.7/ 2
CO2 SAMPLE PERCENT	2.21
CO2 BACKGRD METER READING/SCALE	1.4/ 2
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	38.0/ 3
NOX SAMPLE PPM	114.0
NOX BACKGRD METER READING/SCALE	.3/ 3
NOX BACKGRD PPM	.9
HC CONCENTRATION PPM	127
CO CONCENTRATION PPM	592
CO2 CONCENTRATION PCT	2.16
NOX CONCENTRATION PPM	113.3
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	5.90
CO MASS (GRAMS)	51.26
CO2 MASS (GRAMS)	2918.14
NOX MASS (GRAMS)	13.95
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	1.60 (	2.57)
CO GRAMS/KM (GRAMS/MILE)	15.17 (	24.41)
CO2 GRAMS/KM (GRAMS/MILE)	864 (	1390)
NOX GRAMS/KM (GRAMS/MILE)	3.98 (	6.40)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (	0.00)

HC GRAMS/KG OF FUEL	5.67	HC GRAMS/MIN	1.15
CO GRAMS/KG OF FUEL	53.9	CO GRAMS/MIN	10.9
CO2 GRAMS/KG OF FUEL	3067	CO2 GRAMS/MIN	623
NOX GRAMS/KG OF FUEL	14.13	NOX GRAMS/MIN	2.87
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 38.09 (6.18)

TOTAL CVS FLOW 73.8STD. CU. METRES

TABLE F-27. VEHICLE EMISSION RESULTS

1978 LIGHT DUTY EMISSIONS TEST

ACTUAL DISTANCES USED IN CALCULATIONS

UNIT NO. 28 TEST NO. 9-1 DATE 1/10/78 MFGR. CODE -0 YR. 1975

VEHICLE MODEL CHEV C-60 ECS ENGINE 5.7? LITRE 8 CURB WT. 0 KG GVW 0 KG

BAROMETER 799.78 MM OF HG.
DRY BULB TEMP. 23.9 DEG. C
REL. HUMIDITY 28 PCT.

WET BULB TEMP 18.3 DEG. C
ABS. HUMIDITY 5.2 GRAMS/KG
COMMENTS

EXHAUST EMISSIONS

BLOWER DIF. PRESS., 62. 936.9 MM. H2O
BLOWER INLET PRESS., 61 903.9 MM. H2O
BLOWER INLET TEMP. 46 DEG. C

BAG RESULTS				
BAG NO.		1	2	3
BLOWER REVOLUTIONS		9548	14332	9516
HC	SAMPLE METER READING/SCALE	50.6/ 3	26.9/ 3	33.9/ 3
HC	SAMPLE PPM	506	269	339
HC	BACKGRD METER READING/SCALE	1.7/ 3	1.8/ 3	1.2/ 3
HC	BACKGRD PPM	17	18	12
CO	SAMPLE METER READING/SCALE	68.8/ 3	91.9/11	98.5/ 3
CO	SAMPLE PPM	1783	957	967
CO	BACKGRD METER READING/SCALE	.1/ 3	1.0/11	.1/ 3
CO	BACKGRD PPM	2	9	2
CO2	SAMPLE METER READING/SCALE	59.6/ 2	87.6/ 3	53.8/ 2
CO2	SAMPLE PERCENT	2.52	1.58	2.58
CO2	BACKGRD METER READING/SCALE	1.7/ 2	3.7/ 3	1.2/ 2
CO2	BACKGRD PERCENT	.06	.06	.04
NOX	SAMPLE METER READING/SCALE	51.4/ 3	82.9/ 2	57.3/ 3
NOX	SAMPLE PPM	159.2	82.9	171.9
NOX	BACKGRD METER READING/SCALE	.4/ 3	.9/ 2	.3/ 3
NOX	BACKGRD PPM	1.2	.9	.9
SO2	SAMPLE METER READING/SCALE	-0.0/-0	-0.0/-0	-0.0/-0
SO2	SAMPLE PPM	-0.0	-0.0	-0.0
SO2	BACKGRD METER READING/SCALE	-0.0/-0	-0.0/-0	-0.0/-0
SO2	BACKGRD PPM	-0.0	-0.0	-0.0
HC	CONCENTRATION PPM	493	253	329
CO	CONCENTRATION PPM	1677	936	910
CO2	CONCENTRATION PCT	2.52	1.58	2.47
NOX	CONCENTRATION PPM	159.2	82.1	171.2
SO2	CONCENTRATION PPM	0.0	0.0	0.0
HC	MASS GRAMS	37.52	33.03	25.02
CO	MASS GRAMS	257.92	119.86	139.69
CO2	MASS GRAMS	6087.19	6635.99	5998.81
NOX	MASS GRAMS	32.79	30.08	36.53
SO2	MASS GRAMS	0.00	0.00	0.00
HC	GRAMS/KM (GRAMS/MILE)	6.74 (10.78)	5.30 (8.49)	4.48 (7.18)
CO	GRAMS/KM (GRAMS/MILE)	46.04 (74.12)	18.95 (29.68)	24.73 (39.78)
CO2	GRAMS/KM (GRAMS/MILE)	1087.1 (1749.2)	1049.6 (1688.9)	1053.3 (1699.8)
NOX	GRAMS/KM (GRAMS/MILE)	5.86 (9.42)	4.83 (7.77)	6.47 (10.41)
	FUEL CONSUMPTION BY CB L/100KM (MPG)	50.40 (4.67)	46.76 (5.03)	47.82 (4.92)
	CVS FLOW STD. CU. METRES (SCF)	132.1 (4669.7)	224.1 (7916.1)	131.7 (4652.3)
	CALCULATED DISTANCE KM(MILES)	5.60 (3.48)	6.23 (3.87)	5.65 (3.51)

WEIGHTED FUEL CONSUMPTION LITRES/100KM (MPG) 47.62 (4.94)
WEIGHTED MASS HC GRAMS/KM (GRAMS/MILE) 5.35 (8.61)
WEIGHTED MASS CO GRAMS/KM (GRAMS/MILE) 25.22 (41.96)
WEIGHTED MASS CO2 GRAMS/KM (GRAMS/MILE) 1058.3 (1702.8)
WEIGHTED MASS NOX GRAMS/KM (GRAMS/MILE) 5.98 (8.82)
TOTAL CVS FLOW = 990.0 STD. CU. METRES

TABLE F-28. VEHICLE EMISSION RESULTS

1978 LIGHT DUTY EMISSIONS TEST

ACTUAL DISTANCES USED IN CALCULATIONS

UNIT NO. 20 TEST NO. 7-2 DATE 1/13/78 MFGR. CODE -0 YR. 1975
VEHICLE MODEL CHEV C-60 ECS ENGINE 5.7L LITRE CURB WT. 0 KG GVM 0 KG

BAROMETER 696.25 MM OF HG.
DRY BULB TEMP. 29.9 DEG. C
REL. HUMIDITY 20 PCT.

WET BULB TEMP 15.6 DEG. C
ABS. HUMIDITY 5.3 GRAMS/KG
COMMENTS

EXHAUST EMISSIONS

BLOWER DIF. PRESS., G2, 906.9 MM. H2O
BAG RESULTS

BLOWER INLET PRESS., G1 373.9 MM. H2O
BLOWER INLET TEMP. 65 DEG. C

BAG NO.	1	2	3
BLOWER REVOLUTIONS	9539	16337	9591
HC SAMPLE METER READING/SCALE	90.4/ 3	29.5/ 3	33.6/ 3
HC SAMPLE PPM	904	295	336
HC BACKGRD METER READING/SCALE	1.7/ 3	1.9/ 3	2.0/ 3
HC BACKGRD PPM	17	19	20
CO SAMPLE METER READING/SCALE	79.1/ 3	86.3/11	32.9/ 3
CO SAMPLE PPM	2129	919	761
CO BACKGRD METER READING/SCALE	.6/ 3	2.3/11	.1/ 3
CO BACKGRD PPM	14	7	2
CO2 SAMPLE METER READING/SCALE	57.8/ 2	86.4/ 3	52.0/ 2
CO2 SAMPLE PERCENT	2.79	1.60	2.90
CO2 BACKGRD METER READING/SCALE	1.6/ 2	3.5/ 3	1.9/ 2
CO2 BACKGRD PERCENT	.06	.05	.05
NOX SAMPLE METER READING/SCALE	50.6/ 3	76.9/ 2	60.0/ 3
NOX SAMPLE PPM	151.8	76.9	180.0
NOX BACKGRD METER READING/SCALE	.3/ 3	.9/ 2	.3/ 3
NOX BACKGRD PPM	.9	.9	.9
SO2 SAMPLE METER READING/SCALE	-0.0/-0	-0.0/-0	-0.0/-0
SO2 SAMPLE PPM	-0.0	-0.0	-0.0
SO2 BACKGRD METER READING/SCALE	-0.0/-0	-0.0/-0	-0.0/-0
SO2 BACKGRD PPM	-0.0	-0.0	-0.0
HC CONCENTRATION PPM	391	278	320
CO CONCENTRATION PPM	1992	393	719
CO2 CONCENTRATION PCT	2.69	1.56	2.36
NOX CONCENTRATION PPM	151.1	76.1	179.3
SO2 CONCENTRATION PPM	0.0	0.0	0.0
HC MASS GRAMS	29.95	36.56	24.65
CO MASS GRAMS	308.24	104.14	111.89
CO2 MASS GRAMS	6555.16	6988.91	5765.92
NOX MASS GRAMS	32.58	28.12	38.88
SO2 MASS GRAMS	0.00	0.00	0.00
HC GRAMS/KM (GRAMS/MILE)	5.30 (8.53)	5.81 (9.35)	4.34 (6.98)
CO GRAMS/KM (GRAMS/MILE)	54.58 (87.82)	16.55 (26.63)	19.70 (31.70)
CO2 GRAMS/KM (GRAMS/MILE)	1160.7 (1867.6)	1031.9 (1659.6)	1015.2 (1633.9)
NOX GRAMS/KM (GRAMS/MILE)	5.77 (9.28)	4.47 (7.19)	6.85 (11.01)
FUEL CONSUMPTION BY CB L/100KM (MPG)	53.92 (4.36)	45.92 (5.12)	45.24 (5.20)
CVS FLOW STD. CU. METRES (SCF)	132.9 (4693.6)	227.8 (8043.2)	133.7 (4721.3)
CALCULATED DISTANCE KM(MILES)	5.65 (3.51)	6.29 (3.91)	5.68 (3.53)

WEIGHTED FUEL CONSUMPTION LITRES/100KM (MPG) 47.36 (4.97)
WEIGHTED MASS HC GRAMS/KM (GRAMS/MILE) 5.31 (8.54)
WEIGHTED MASS CO GRAMS/KM (GRAMS/MILE) 25.14 (40.45)
WEIGHTED MASS CO2 GRAMS/KM (GRAMS/MILE) 1053.3 (1694.8)
WEIGHTED MASS NOX GRAMS/KM (GRAMS/MILE) 5.38 (8.65)
TOTAL CVS FLOW = 494.4 STD. CU. METRES

APPENDIX G

CHASSIS DYNAMOMETER TRANSIENT TEST RESULTS - EMISSIONS CONTROL SYSTEM WITH CATALYST

TABLES G-1 & G-2	Summary of the Results
TABLES G-3 through G-10	CAPE-21C - Run 1
TABLES G-11 through G-18	CAPE-21C - Run 2
TABLES G-19 through G-22	CAPE-21H - Run 1
TABLES G-23 through G-26	CAPE-21H - Run 2
TABLES G-27 through G-28	Light-Duty FTP

TABLE G-1. CHASSIS DYNAMOMETER TRANSIENT EVALUATIONS WITH THE EMISSION CONTROL SYSTEM WITH CATALYST

Test	Cycle	Bag	Emissions, g/km HC	CO	NO_x	CO_2	Fuel ℓ/100km	Emissions, g/km HC	CO	NO_x	CO_2	Fuel ℓ/100km
CAPE-21C	LA-NF	1	16.97	102.44	2.17	1104	56.30	14.82	93.19	1.96	1081	54.41
	LA-F	2	0.24	22.09	3.52	1015	44.85	0.22	34.39	3.48	1017	45.76
	LA-NF	3	0.25	6.83	2.17	939	40.58	0.37	7.61	2.05	912	39.47
	LA-F	4	0.20	30.55	2.97	963	43.17	0.30	36.73	3.06	963	43.59
	NY-NF	5	1.57	8.08	4.50	1240	53.68	1.28	9.18	4.30	1238	53.61
	NY-F	6	0.17	8.49	3.30	899	38.96	0.19	9.96	3.25	898	39.00
	LA-NF	7	0.82	5.14	2.31	944	40.73	1.02	5.14	2.38	940	40.61
	LA-F	8	0.22	26.47	3.32	952	42.45	0.22	32.78	3.37	991	44.52
CAPE-21H	LA-NF	1	1.46	6.30	2.54	924	40.05	2.08	5.71	2.67	952	41.28
	LA-F	2	0.11	22.93	3.00	1004	44.41	0.29	21.69	3.74	973	43.04
	NY-NF	3	1.67	6.21	4.25	1210	52.30	1.46	7.28	4.91	1243	53.73
	NY-F	4	0.22	9.16	3.39	884	38.37	0.17	9.19	3.28	854	37.09
LD-FTP	505C	1	3.91	45.12	4.10	1088	50.00	3.21	37.35	4.96	1105	50.09
	867S	2	1.51	9.36	3.56	1062	46.17	1.88	7.64	3.82	1047	45.46
	505H	3	1.41	13.44	5.37	1037	45.36	1.54	18.70	4.88	1057	46.58
	TOTAL		1.97	17.77	4.16	1061	46.74	2.06	16.66	4.34	1062	46.70

TABLE G-2. CHASSIS DYNAMOMETER TRANSIENT EVALUATIONS WITH THE EMISSION CONTROL SYSTEM WITH CATALYST

Test	Cycle	Bag	Emissions, g/min HC	CO	NO_x	CO_2	Fuel g/min	Emissions, g/min HC	CO	NO_x	CO_2	Fuel g/min
CAPE-21C	LA-NF	1	6.56	39.6	0.84	427	160.9	5.77	36.2	0.76	421	156.6
	LA-F	2	0.29	26.4	4.21	1214	396.5	0.27	41.3	4.18	1223	406.6
	LA-NF	3	0.10	2.7	0.85	369	117.9	0.14	3.0	0.81	361	115.6
	LA-F	4	0.24	36.7	3.57	1157	383.5	0.36	44.3	3.69	1161	388.7
	NY-NF	5	0.32	1.7	0.92	254	81.3	0.27	1.9	0.89	256	82.0
	NY-F	6	0.12	6.1	2.38	650	208.3	0.14	7.3	2.38	657	211.1
	LA-NF	7	0.32	2.0	0.90	368	117.4	0.40	2.0	0.93	369	117.8
	LA-F	8	0.27	31.9	4.00	1148	378.3	0.27	39.7	4.08	1199	398.2
CAPE-21H	LA-NF	1	0.58	2.5	1.00	365	117.0	0.81	2.2	1.04	372	119.3
	LA-F	2	0.13	27.8	3.63	1217	397.8	0.35	25.8	4.44	1158	378.6
	NY-NF	3	0.34	1.3	0.87	248	79.2	0.30	1.5	0.99	251	80.2
	NY-F	4	0.16	6.7	2.47	644	206.7	0.13	6.6	2.38	618	198.4
LD-FTP	505C	1	2.62	30.2	2.75	728	247.0	2.13	24.8	3.29	734	245.6
	867S	2	0.65	4.06	1.55	461	147.9	0.82	3.33	1.67	456	146.2
	505H	3	0.95	9.02	3.60	696	224.7	1.03	12.54	3.27	709	230.6
	TOTAL		1.03	9.26	2.17	553	179.8	1.07	8.68	2.26	553	179.5

TABLE G-3. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/ 9/78	TIME -0 HRS.	TEST NO. 5
MODEL 1975 CHEV C-60 ECSW	CRUN-1 BAG-1 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 11 C	DRY BULB TEMP 23 C	REL. HUM. 16.5 PCT
SPEC. HUM. 2.9 GRAM/KG	BARO. 749.8 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 1.850 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	9.78 MINUTES
BLOWER INLET PRESS.	383.5 MM. H2O
BLOWER DIF. PRESS.	424.2 MM H2O
BLOWER INLET TEMP.	24 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5403
BLOWER CU. CM /REV.	16746

BAG RESULTS

HC SAMPLE METER READING/SCALE	65.4/ 3
HC SAMPLE PPM	654
HC BACKGRD METER READING/SCALE	1.2/ 3
HC BACKGRD PPM	12
CO SAMPLE METER READING/SCALE	75.1/ 3
CO SAMPLE PPM	1991
CO BACKGRD METER READING/SCALE	.2/ 3
CO BACKGRD PPM	5
CO2 SAMPLE METER READING/SCALE	74.9/ 3
CO2 SAMPLE PERCENT	1.36
CO2 BACKGRD METER READING/SCALE	3.4/ 3
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	31.6/ 2
NOX SAMPLE PPM	31.6
NOX BACKGRD METER READING/SCALE	.4/ 2
NOX BACKGRD PPM	.4
HC CONCENTRATION PPM	693
CO CONCENTRATION PPM	1924
CO2 CONCENTRATION PCT	1.32
NOX CONCENTRATION PPM	31.2
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	31.40
CO MASS (GRAMS)	189.54
CO2 MASS (GRAMS)	2043.22
NOX MASS (GRAMS)	4.02
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	16.97	(27.31)
CO GRAMS/KM (GRAMS/MILE)	102.99	(165.82)
CO2 GRAMS/KM (GRAMS/MILE)	1104	(1777)
NOX GRAMS/KM (GRAMS/MILE)	2.17	(3.49)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	40.78	HC GRAMS/MIN	4.56
CO GRAMS/KG OF FUEL	246.1	CO GRAMS/MIN	34.6
CO2 GRAMS/KG OF FUEL	2653	CO2 GRAMS/MIN	427
NOX GRAMS/KG OF FUEL	5.22	NOX GRAMS/MIN	.84
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 58.30 (4.18)

TOTAL CVS FLOW= 89.7STD. CU. METRES

TABLE G-4. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/ 9/78	TIME -0 HRS.	TEST NO. 5
MODEL 1975 CHEV C-60 ECSW	CRUN-1 BAG-2 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 11 C	DRY BULB TEMP 24 C	REL. HUM. 15.8 PCT
SPEC. HUM. 2.9 GRAM/KG	BARO. 749.8 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 5.374 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	9.50 MINUTES
BLOWER INLET PRESS.	429.2 MM. H20
BLOWER DIF. PRESS.	457.2 MM H20
BLOWER INLET TEMP.	24 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5076
BLOWER CU. CM /REV.	16976

BAG RESULTS

HC SAMPLE METER READING/SCALE	91.2/ 2
HC SAMPLE PPM	91
HC BACKGRD METER READING/SCALE	12.3/ 2
HC BACKGRD PPM	12
CO SAMPLE METER READING/SCALE	64.1/ 3
CO SAMPLE PPM	1635
CO BACKGRD METER READING/SCALE	.4/ 3
CO BACKGRD PPM	9
CO2 SAMPLE METER READING/SCALE	82.4/ 2
CO2 SAMPLE PERCENT	4.37
CO2 BACKGRD METER READING/SCALE	1.3/ 2
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	60.4/ 3
NOX SAMPLE PPM	181.2
NOX BACKGRD METER READING/SCALE	.2/ 3
NOX BACKGRD PPM	.6
HC CONCENTRATION PPM	33
CO CONCENTRATION PPM	1483
CO2 CONCENTRATION PCT	4.34
NOX CONCENTRATION PPM	180.8
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	1.31
CO MASS (GRAMS)	118.69
CO2 MASS (GRAMS)	5456.75
NOX MASS (GRAMS)	18.91
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	.24 (	.39)
CO GRAMS/KM (GRAMS/MILE)	22.09 (	35.54)
CO2 GRAMS/KM (GRAMS/MILE)	1015 (	1634)
NOX GRAMS/KM (GRAMS/MILE)	3.52 (	5.66)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (	0.00)

HC GRAMS/KG OF FUEL	.79	HC GRAMS/MIN	.29
CO GRAMS/KG OF FUEL	66.6	CO GRAMS/MIN	26.4
CO2 GRAMS/KG OF FUEL	3062	CO2 GRAMS/MIN	1214
NOX GRAMS/KG OF FUEL	10.62	NOX GRAMS/MIN	4.21
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 44.85 (5.24)

TOTAL CVS FLOW= 68.8STD. CU. METRES

TABLE G-5. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/ 9/78	TIME -0 HRS.	TEST NO. 5
MODEL 1975 CHEV C-60 ECSWCRUN-1 BAG-3 21C		ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 11 C	DRY BULB TEMP 23 C	REL. HUM. 19.7 PCT
SPEC. HUM. 2.6 GRAM/KG	BARO. 749.6 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 1.866 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.76 MINUTES
BLOWER INLET PRESS.	327.7 MM. H20
BLOWER DIF. PRESS.	360.7 MM H20
BLOWER INLET TEMP.	65 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5399
BLOWER CU. CM /REV.	17072

BAG RESULTS

HC SAMPLE METER READING/SCALE	20.7/ 2
HC SAMPLE PPM	21
HC BACKGRD METER READING/SCALE	11.3/ 2
HC BACKGRD PPM	11
CO SAMPLE METER READING/SCALE	66.9/12
CO SAMPLE PPM	149
CO BACKGRD METER READING/SCALE	.7/12
CO BACKGRD PPM	1
CO2 SAMPLE METER READING/SCALE	72.1/ 3
CO2 SAMPLE PERCENT	1.31
CO2 BACKGRD METER READING/SCALE	3.6/ 3
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	35.9/ 2
NOX SAMPLE PPM	35.9
NOX BACKGRD METER READING/SCALE	.7/ 2
NOX BACKGRD PPM	.7
HC CONCENTRATION PPM	11
CO CONCENTRATION PPM	149
CO2 CONCENTRATION PCT	1.26
NOX CONCENTRATION PPM	35.3
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	.96
CO MASS (GRAMS)	12.75
CO2 MASS (GRAMS)	1753.27
NOX MASS (GRAMS)	4.06
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	.25 (.40)
CO GRAMS/KM (GRAMS/MILE)	6.83 (11.00)
CO2 GRAMS/KM (GRAMS/MILE)	939 (1511)
NOX GRAMS/KM (GRAMS/MILE)	2.17 (3.50)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)

HC GRAMS/KG OF FUEL	.82	HC GRAMS/MIN	.10
CO GRAMS/KG OF FUEL	22.8	CO GRAMS/MIN	2.7
CO2 GRAMS/KG OF FUEL	3131	CO2 GRAMS/MIN	369
NOX GRAMS/KG OF FUEL	7.25	NOX GRAMS/MIN	.85
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 40.58 (5.80)

TOTAL CVS FLOW= 26.2STD. CU. METRES

TABLE G-6. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/ 9/78 TIME -0 HRS. TEST NO. 5
MODEL 1975 CHEV C-6U ECS4CHUN-1 BAG-9 21C ENGINE 5.7 LITHEV 8
DRIVER KEN TEST WT. 7711 KG. GVW 0 KG
WET BULB TEMP 11 C DRY BULB TEMP 24 C REL. HUM. 19.1 PCT
SPEC. HUM. 2.7 GRAM/KG BARO. 799.3 MM HG. MEASURED FUEL 0.00 KG
DISTANCE 5.390 KM FUEL 739.2 G/LITRE FUEL MC RATIO 1.860

RUN DURATION	9.48 MINUTES
BLOWER INLET PRESS.	903.9 MM. H20
BLOWER DIF. PRESS.	931.8 MM H20
BLOWER INLET TEMP.	90 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5076
BLOWER CU. CM /REV.	16983

BAG RESULTS

HC SAMPLE METER READING/SCALE	35.0/ 2
HC SAMPLE PPM	35
HC BACKGRD METER READING/SCALE	10.0/ 2
HC BACKGRD PPM	10
CO SAMPLE METER READING/SCALE	85.9/ 3
CO SAMPLE PPM	2357
CO BACKGRD METER READING/SCALE	.2/ 3
CO BACKGRD PPM	5
CO2 SAMPLE METER READING/SCALE	81.9/ 2
CO2 SAMPLE PERCENT	9.33
CO2 BACKGRD METER READING/SCALE	1.3/ 2
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	53.7/ 3
NOX SAMPLE PPM	161.1
NOX BACKGRD METER READING/SCALE	.2/ 3
NOX BACKGRD PPM	.6
HC CONCENTRATION PPM	28
CO CONCENTRATION PPM	2196
CO2 CONCENTRATION PCT	9.30
NOX CONCENTRATION PPM	160.7
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	1.08
CO MASS (GRAMS)	169.68
CO2 MASS (GRAMS)	5189.37
NOX MASS (GRAMS)	16.03
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	.20 (	.32)
CO GRAMS/KM (GRAMS/MILE)	30.55 (	99.16)
CO2 GRAMS/KM (GRAMS/MILE)	963 (	1549)
NOX GRAMS/KM (GRAMS/MILE)	2.97 (	9.78)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (	0.00)

HC GRAMS/KG OF FUEL	.63	HC GRAMS/MIN	.24
CO GRAMS/KG OF FUEL	96.7	CO GRAMS/MIN	36.7
CO2 GRAMS/KG OF FUEL	3017	CO2 GRAMS/MIN	1157
NOX GRAMS/KG OF FUEL	9.32	NOX GRAMS/MIN	3.57
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 93.17 (5.95)

TOTAL CVS FLOW 65.4810. CU. METRES

TABLE G-7. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/ 9/78	TIME -0 HRS.	TEST NO. 5
MODEL 1975 CHEV C-60 ECS=CHUN-1 BAG-5 21C		ENGINE 5.7 LITHEV R
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 12 C	DRY BULB TEMP 25 C	REL. HUM. 15.2 PCT
SPEC. HUM. 3.0 GRAM/KG	BARO. 744.3 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE .869 KM	FUEL 738.2 G/LITRE	FUEL MC RATIO 1.840

RUN DURATION	9.25 MINUTES
BLOWER INLET PRESS.	392.9 MM. H2O
BLOWER DIF. PRESS.	375.9 MM H2O
BLOWER INLET TEMP.	65 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	4935
BLOWER CU. CM /REV.	17060

BAG RESULTS	
HC SAMPLE METER READING/SCALE	99.7/ 2
HC SAMPLE PPM	45
HC BACKGRD METER READING/SCALE	10.7/ 2
HC BACKGRD PPM	11
CO SAMPLE METER READING/SCALE	91.9/13
CO SAMPLE PPM	92
CO BACKGRD METER READING/SCALE	1.8/13
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	52.1/ 3
CO2 SAMPLE PERCENT	.91
CO2 BACKGRD METER READING/SCALE	3.0/ 3
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	38.9/ 2
NOX SAMPLE PPM	38.9
NOX BACKGRD METER READING/SCALE	.8/ 2
NOX BACKGRD PPM	.8
HC CONCENTRATION PPM	35
CO CONCENTRATION PPM	89
CO2 CONCENTRATION PCT	.86
NOX CONCENTRATION PPM	37.7
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	1.36
CO MASS (GRAMS)	7.02
CO2 MASS (GRAMS)	1077.38
NOX MASS (GRAMS)	3.91
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	1.57 (2.52)		
CO GRAMS/KM (GRAMS/MILE)	8.08 (13.01)		
CO2 GRAMS/KM (GRAMS/MILE)	1240 (1995)		
NOX GRAMS/KM (GRAMS/MILE)	4.50 (7.24)		
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)		
HC GRAMS/KG OF FUEL	3.95	HC GRAMS/MIN	.32
CO GRAMS/KG OF FUEL	20.4	CO GRAMS/MIN	1.7
CO2 GRAMS/KG OF FUEL	3125	CO2 GRAMS/MIN	254
NOX GRAMS/KG OF FUEL	11.33	NOX GRAMS/MIN	.92
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 53.68 (4.38)

TOTAL CVS FLOW 64.1570. CU. METRES

TABLE G-8. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/ 9/78	TIME -0 HRS.		TEST NO. 5
MODEL 1975 CHEV C-60 ECS4	CRUN-1 BAG-6 21C		ENGINE 5.7 LITHEV 8
DRIVER KEN	TEST WT. 7711 KG.		GVW 0 KG
WET BULB TEMP 12 C	DRY BULB TEMP 26 C		REL. HUM. 13.6 PCT
SPEC. HUM. 2.8 GRAM/KG	BARO. 749.0 MM HG.		MEASURED FUEL 0.00 KG
DISTANCE 3.379 KM	FUEL 738.2 G/LITRE		FUEL HC RATIO 1.860

RUN DURATION	9.67 MINUTES
BLOWER INLET PRESS.	386.1 MM. H20
BLOWER DIF. PRESS.	919.1 MM H20
BLOWER INLET TEMP.	69 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5240
BLOWER CU. CM /REV.	17023

BAG RESULTS

HC SAMPLE METER READING/SCALE	21.9/ 2
HC SAMPLE PPM	21
HC BACKGRD METER READING/SCALE	10.0/ 2
HC BACKGRD PPM	10
CO SAMPLE METER READING/SCALE	77.8/11
CO SAMPLE PPM	350
CO BACKGRD METER READING/SCALE	.5/11
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	50.1/ 2
CO2 SAMPLE PERCENT	2.29
CO2 BACKGRD METER READING/SCALE	1.7/ 2
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	33.1/ 3
NOX SAMPLE PPM	99.3
NOX BACKGRD METER READING/SCALE	.1/ 3
NOX BACKGRD PPM	.3
HC CONCENTRATION PPM	13
CO CONCENTRATION PPM	332
CO2 CONCENTRATION PCT	2.24
NOX CONCENTRATION PPM	99.1
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	.56
CO MASS (GRAMS)	28.67
CO2 MASS (GRAMS)	3037.56
NOX MASS (GRAMS)	11.14
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	.17 (	.27)
CO GRAMS/KM (GRAMS/MILE)	8.49 (	13.65)
CO2 GRAMS/KM (GRAMS/MILE)	899 (	1446)
NOX GRAMS/KM (GRAMS/MILE)	3.30 (	5.30)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (	0.00)

HC GRAMS/KG OF FUEL	.58	HC GRAMS/MIN	.12
CO GRAMS/KG OF FUEL	29.5	CO GRAMS/MIN	4.1
CO2 GRAMS/KG OF FUEL	3121	CO2 GRAMS/MIN	650
NOX GRAMS/KG OF FUEL	11.44	NOX GRAMS/MIN	2.38
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 38.96 (6.04)

TOTAL CVS FLOW= 24.2810. CU. METRES

TABLE G-9. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/ 9/78 TIME -0 HRS. TEST NO. 5
MODEL 1975 CHEV C-60 ECS4CHRUN-1 BAG-2 21C ENGINE 5.7 LITHEV 8
DRIVER KEN TEST WT. 7711 KG. GVW 0 KG
WET BULB TEMP 12 C DRY BULB TEMP 27 C REL. HUM. 10.6 PCT
SPEC. HUM. 2.3 GRAM/KG BARO. 748.8 MM HG. MEASURED FUEL 0.00 KG
DISTANCE 1.866 KM FUEL 738.2 G/LITRE FUEL MC RATIO 1.860

RUN DURATION	4.29	MINUTES
BLOWER INLET PRESS.	378.5	MM. H2O
BLOWER DIF. PRESS.	914.0	MM H2O
BLOWER INLET TEMP.	31	DEG. C
DYNO REVOLUTIONS	-0	
BLOWER REVOLUTIONS	5390	
BLOWER CU. CM /REV.	16823	

BAG RESULTS

HC SAMPLE METER READING/SCALE	90.1/ 2
HC SAMPLE PPM	90
HC BACKGRD METER READING/SCALE	8.8/ 2
HC BACKGRD PPM	9
CO SAMPLE METER READING/SCALE	96.9/12
CO SAMPLE PPM	103
CO BACKGRD METER READING/SCALE	.5/12
CO BACKGRD PPM	1
CO2 SAMPLE METER READING/SCALE	66.6/ 3
CO2 SAMPLE PERCENT	1.20
CO2 BACKGRD METER READING/SCALE	2.5/ 3
CO2 BACKGRD PERCENT	.04
NOX SAMPLE METER READING/SCALE	35.1/ 2
NOX SAMPLE PPM	35.1
NOX BACKGRD METER READING/SCALE	.9/ 2
NOX BACKGRD PPM	.9
HC CONCENTRATION PPM	32
CO CONCENTRATION PPM	99
CO2 CONCENTRATION PCT	1.16
NOX CONCENTRATION PPM	34.7
SO2 CUCENTRATION PPM	0.0
HC MASS (GRAMS)	1.53
CO MASS (GRAMS)	9.59
CO2 MASS (GRAMS)	1761.05
NOX MASS (GRAMS)	4.31
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	.82	(1.32)
CO GRAMS/KM (GRAMS/MILE)	5.14	(8.27)
CO2 GRAMS/KM (GRAMS/MILE)	944	(1518)
NOX GRAMS/KM (GRAMS/MILE)	2.31	(3.72)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	2.73	HC GRAMS/MIN	.32
CO GRAMS/KG OF FUEL	17.1	CO GRAMS/MIN	2.0
CO2 GRAMS/KG OF FUEL	3139	CO2 GRAMS/MIN	368
NOX GRAMS/KG OF FUEL	7.68	NOX GRAMS/MIN	.90
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 40.73 (5.78)

TOTAL CVS FLOW 82.9STD. CU. METERS

TABLE G-10. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/ 9/78 TIME -0 HRS. TEST NO. 5
MODEL 1975 CHEV C-60 ECS=CHUN-1 BAG-8 21C ENGINE 5.7 LITREV 8
DRIVER KEN TEST WT. 7711 KG. GVW 0 KG
WET BULB TEMP 12 C DRY BULB TEMP 28 C REL. HUM. 10.3 PCT
SPEC. HUM. 2.4 GRAM/KG BARO. 748.5 MM HG. MEASURED FUEL 0.00 KG
DISTANCE 5.390 KM FUEL 738.2 G/LITRE FUEL HC RATIO 1.860

RUN DURATION 9.97 MINUTES
BLOWER INLET PRESS. 908.9 MM. H20
BLOWER DIF. PRESS. 939.6 MM H20
BLOWER INLET TEMP. 76 DEG. C
DYNO REVOLUTIONS -0
BLOWER REVOLUTIONS 5030
BLOWER CU. CM /REV. 1698S

BAG RESULTS		
HC	SAMPLE METER READING/SCALE	36.1/ 2
HC	SAMPLE PPM	36
HC	BACKGRD METER READING/SCALE	8.5/ 2
HC	BACKGRD PPM	9
CO	SAMPLE METER READING/SCALE	79.7/ 3
CO	SAMPLE PPM	1977
CO	BACKGRD METER READING/SCALE	.1/ 3
CO	BACKGRD PPM	2
CO2	SAMPLE METER READING/SCALE	79.7/ 2
CO2	SAMPLE PERCENT	9.18
CO2	BACKGRD METER READING/SCALE	1.9/ 2
CO2	BACKGRD PERCENT	.05
NOX	SAMPLE METER READING/SCALE	58.8/ 3
NOX	SAMPLE PPM	176.9
NOX	BACKGRD METER READING/SCALE	.2/ 3
NOX	BACKGRD PPM	.6
HC	CONCENTRATION PPM	30
CO	CONCENTRATION PPM	1810
CO2	CONCENTRATION PCT	9.19
NOX	CONCENTRATION PPM	176.0
SO2	CONCENTRATION PPM	0.0
HC	MASS (GRAMS)	1.19
CO	MASS (GRAMS)	102.66
CO2	MASS (GRAMS)	5132.69
NOX	MASS (GRAMS)	17.89
SO2	MASS (GRAMS)	0.00

HC	GRAMS/KM (GRAMS/MILE)	.22 (.35)
CO	GRAMS/KM (GRAMS/MILE)	20.97 (32.59)
CO2	GRAMS/KM (GRAMS/MILE)	952 (1532)
NOX	GRAMS/KM (GRAMS/MILE)	3.32 (5.34)
SO2	GRAMS/KM (GRAMS/MILE)	0.00 (0.00)

HC	GRAMS/KG OF FUEL	.20	HC	GRAMS/MIN	.27
CO	GRAMS/KG OF FUEL	24.3	CO	GRAMS/MIN	31.9
CO2	GRAMS/KG OF FUEL	3035	CO2	GRAMS/MIN	1198
NOX	GRAMS/KG OF FUEL	10.58	NOX	GRAMS/MIN	4.00
SO2	GRAMS/KG OF FUEL	0.00	SO2	GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 42.05 (5.59)

TOTAL CVS FLOW 67.251U. CU. METERS

TABLE G-11. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 4/10/78	TIME -0 HRS.	TEST NO. 5
MODEL 1978 CHEV C-60 LCS=C40/0-2 BAG-1 21C		ENGINE 5.7 LITRE= 8
DRIVER REM	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 12 C	DRY BULB TEMP 23 C	REL. HUM. 32.7 PCT
SPEC. HUM. 3.4 GRAM/KG	BARO. 744.0 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 1.866 KM	FUEL 739.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	9.80 MINUTES
BLOWER INLET PRESS.	703.9 MM. H20
BLOWER DIF. PRESS.	939.3 MM H20
BLOWER INLET TEMP.	28 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5921
BLOWER CU. CM /REV.	16763

BAG RESULTS

HC SAMPLE METER READING/SCALE	50.5/ 3
HC SAMPLE PPM	505
HC BACKGRD METER READING/SCALE	1.3/ 3
HC BACKGRD PPM	13
CO SAMPLE METER READING/SCALE	71.0/ 3
CO SAMPLE PPM	1859
CO BACKGRD METER READING/SCALE	.3/ 3
CO BACKGRD PPM	7
CO2 SAMPLE METER READING/SCALE	74.6/ 3
CO2 SAMPLE PERCENT	1.36
CO2 BACKGRD METER READING/SCALE	3.0/ 3
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	28.7/ 2
NOX SAMPLE PPM	28.7
NOX BACKGRD METER READING/SCALE	.8/ 2
NOX BACKGRD PPM	.8
HC CONCENTRATION PPM	534
CO CONCENTRATION PPM	1786
CO2 CONCENTRATION PCT	1.32
NOX CONCENTRATION PPM	28.0
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	27.66
CO MASS (GRAMS)	173.93
CO2 MASS (GRAMS)	2418.11
NOX MASS (GRAMS)	3.66
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	14.82 (23.85)		
CO GRAMS/KM (GRAMS/MILE)	93.19 (149.96)		
CO2 GRAMS/KM (GRAMS/MILE)	1081 (1740)		
NOX GRAMS/KM (GRAMS/MILE)	1.96 (3.16)		
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)		
HC GRAMS/KG OF FUEL 36.85		HC GRAMS/MIN	5.77
CO GRAMS/KG OF FUEL 231.7		CO GRAMS/MIN	36.2
CO2 GRAMS/KG OF FUEL 2688		CO2 GRAMS/MIN	421
NOX GRAMS/KG OF FUEL 4.88		NOX GRAMS/MIN	.76
SO2 GRAMS/KG OF FUEL 0.00		SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 24.91 (9.32)

TOTAL CVS FLOW 83.2STD. CU. METERS

TABLE G-12. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/10/78 TIME -0 HRS. TEST NO. 5
MODEL 1975 CHEV C-6M ECSMCRUN-2 BAG-2 21C ENGINE 5.7 LITHEV 8
DRIVER KEN TEST WT. 3311 KG. GVW 0 KG
WET BULB TEMP 12 C DRY BULB TEMP 23 C REL. HUM. 23.7 PCT
SPEC. HUM. 4.3 GRAM/KG BARO. 744.0 MM HG. MEASURED FUEL 0.00 KG
DISTANCE 5.390 KM FUEL 338.2 G/LITRE FUEL MC RATIO 1.860

RUN DURATION 9.48 MINUTES
BLOWER INLET PRESS. 936.9 MM. H20
BLOWER DIF. PRESS. 959.3 MM H20
BLOWER INLET TEMP. 76 DEG. C
DYNO REVOLUTIONS -0
BLOWER REVOLUTIONS 5068
BLOWER CU. CM /REV. 18971

BAG RESULTS

HC SAMPLE METER READING/SCALE	90.6/ 2
HC SAMPLE PPM	91
HC BACKGRD METER READING/SCALE	15.0/ 2
HC BACKGRD PPM	15
CO SAMPLE METER READING/SCALE	91.6/ 3
CO SAMPLE PPM	2595
CO BACKGRD METER READING/SCALE	.8/ 3
CO BACKGRD PPM	10
CO2 SAMPLE METER READING/SCALE	83.5/ 2
CO2 SAMPLE PERCENT	9.95
CO2 BACKGRD METER READING/SCALE	1.8/ 2
CO2 BACKGRD PERCENT	.03
NOX SAMPLE METER READING/SCALE	58.9/ 3
NOX SAMPLE PPM	176.2
NOX BACKGRD METER READING/SCALE	.3/ 3
NOX BACKGRD PPM	.9
HC CONCENTRATION PPM	31
CO CONCENTRATION PPM	2391
CO2 CONCENTRATION PCT	9.90
NOX CONCENTRATION PPM	174.6
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	1.21
CO MASS (GRAMS)	105.35
CO2 MASS (GRAMS)	5484.88
NOX MASS (GRAMS)	18.73
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	.22 (.36)
CO GRAMS/KM (GRAMS/MILE)	34.39 (55.33)
CO2 GRAMS/KM (GRAMS/MILE)	1017 (1637)
NOX GRAMS/KM (GRAMS/MILE)	3.48 (5.59)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)

HC GRAMS/KG OF FUEL	.66	HC GRAMS/MIN	.27
CO GRAMS/KG OF FUEL	101.6	CO GRAMS/MIN	41.3
CO2 GRAMS/KG OF FUEL	3008	CO2 GRAMS/MIN	1223
NOX GRAMS/KG OF FUEL	10.27	NOX GRAMS/MIN	4.18
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 46.76 (5.14)

TOTAL EVB FLOW 68.0810. CU. METHES

TABLE G-13. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/10/78	TIME -0 HRS.	TEST NO. 5
MODEL 1975 CHEV C-60 ECS4CRUN-2 BAG-3 21C		ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 13 C	DRY BULB TEMP 24 C	REL. HUM. 25.7 PCT
SPEC. HUM. 4.9 GRAM/KG	BARO. 749.0 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 1.893 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	9.96 MINUTES
BLOWER INLET PRESS.	353.1 MM. H2O
BLOWER DIF. PRESS.	381.0 MM H2O
BLOWER INLET TEMP.	66 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5496
BLOWER CU. CM /REV.	17053

BAG RESULTS

HC SAMPLE METER READING/SCALE	26.5/ 2
HC SAMPLE PPM	26
HC BACKGRD METER READING/SCALE	11.9/ 2
HC BACKGRD PPM	12
CO SAMPLE METER READING/SCALE	75.5/12
CO SAMPLE PPM	173
CO BACKGRD METER READING/SCALE	2.7/12
CO BACKGRD PPM	5
CO2 SAMPLE METER READING/SCALE	71.9/ 3
CO2 SAMPLE PERCENT	1.29
CO2 BACKGRD METER READING/SCALE	3.9/ 3
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	32.3/ 2
NOX SAMPLE PPM	32.3
NOX BACKGRD METER READING/SCALE	.7/ 2
NOX BACKGRD PPM	.7
HC CONCENTRATION PPM	16
CO CONCENTRATION PPM	163
CO2 CONCENTRATION PCT	1.24
NOX CONCENTRATION PPM	31.7
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	.69
CO MASS (GRAMS)	14.32
CO2 MASS (GRAMS)	1716.39
NOX MASS (GRAMS)	3.85
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	.37	(.59)
CO GRAMS/KM (GRAMS/MILE)	7.61	(12.24)
CO2 GRAMS/KM (GRAMS/MILE)	912	(1467)
NOX GRAMS/KM (GRAMS/MILE)	2.05	(3.29)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	1.25	HC GRAMS/MIN	.14
CO GRAMS/KG OF FUEL	26.1	CO GRAMS/MIN	3.0
CO2 GRAMS/KG OF FUEL	3124	CO2 GRAMS/MIN	361
NOX GRAMS/KG OF FUEL	7.01	NOX GRAMS/MIN	.81
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 39.47 (5.96)

TOTAL CVS FLOW= 75.7510. CU. METRES

TABLE G-14. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/10/78 TIME -0 HRS. TEST NO. 5
MODEL 1975 CHEV C-60 ECS*CRUN-2 BAG-4 21C ENGINE 5.7 LITREV 8
DRIVER KEN TEST WT. 7711 KG. GVW 0 KG
WET BULB TEMP 14 C DRY BULB TEMP 25 C REL. HUM. 26.6 PCT
SPEC. HUM. 5.3 GRAM/KG BARO. 749.0 MM HG. MEASURED FUEL 0.00 KG
DISTANCE 5.922 KM FUEL 738.2 G/LITRE FUEL MC RATIO 1.860

RUN DURATION	9.49 MINUTES
BLOWER INLET PRESS.	375.9 MM. H20
BLOWER DIF. PRESS.	911.5 MM H20
BLOWER INLET TEMP.	95 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5090
BLOWER CU. CM /REV.	16996

BAG RESULTS

HC SAMPLE METER READING/SCALE	50.7/ 2
HC SAMPLE PPM	51
HC BACKGRD METER READING/SCALE	11.9/ 2
HC BACKGRD PPM	12
CO SAMPLE METER READING/SCALE	57.7/ 2
CO SAMPLE PPM	2892
CO BACKGRD METER READING/SCALE	.1/ 2
CO BACKGRD PPM	4
CO2 SAMPLE METER READING/SCALE	82.9/ 2
CO2 SAMPLE PERCENT	4.40
CO2 BACKGRD METER READING/SCALE	1.6/ 2
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	52.4/ 3
NOX SAMPLE PPM	157.2
NOX BACKGRD METER READING/SCALE	.4/ 3
NOX BACKGRD PPM	1.2
HC CONCENTRATION PPM	43
CO CONCENTRATION PPM	2619
CO2 CONCENTRATION PCT	4.37
NOX CONCENTRATION PPM	156.4
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	1.62
CO MASS (GRAMS)	199.14
CO2 MASS (GRAMS)	5220.04
NOX MASS (GRAMS)	16.57
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	.30	(.48)
CO GRAMS/KM (GRAMS/MILE)	36.73	(59.09)
CO2 GRAMS/KM (GRAMS/MILE)	963	(1549)
NOX GRAMS/KM (GRAMS/MILE)	3.06	(4.92)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	.93	HC GRAMS/MIN	.36
CO GRAMS/KG OF FUEL	114.0	CO GRAMS/MIN	44.3
CO2 GRAMS/KG OF FUEL	2987	CO2 GRAMS/MIN	1161
NOX GRAMS/KG OF FUEL	9.48	NOX GRAMS/MIN	3.69
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 43.59 (5.40)

TOTAL CVS FLOW= 65.3STD. CU. METRES

TABLE G-15. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/10/78	TIME -0 HRS.	TEST NO. 5
MODEL 1975 CHEV C-60 ECSW	CRUN-2 BAG-5 21C	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 15 C	DRY BULB TEMP 26 C	REL. HUM. 28.4 PCT
SPEC. HUM. 6.0 GRAM/KG	BARO. 749.3 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE .885 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	4.27 MINUTES
BLOWER INLET PRESS.	332.7 MM. H20
BLOWER DIF. PRESS.	363.2 MM H20
BLOWER INLET TEMP.	72 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	4859
BLOWER CU. CM /REV.	17065

BAG RESULTS	
HC SAMPLE METER READING/SCALE	39.3/ 2
HC SAMPLE PPM	39
HC BACKGRD METER READING/SCALE	10.8/ 2
HC BACKGRD PPM	11
CO SAMPLE METER READING/SCALE	49.6/12
CO SAMPLE PPM	109
CO BACKGRD METER READING/SCALE	1.5/12
CO BACKGRD PPM	3
CO2 SAMPLE METER READING/SCALE	53.8/ 3
CO2 SAMPLE PERCENT	.94
CO2 BACKGRD METER READING/SCALE	3.5/ 3
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	34.7/ 2
NOX SAMPLE PPM	34.7
NOX BACKGRD METER READING/SCALE	.5/ 2
NOX BACKGRD PPM	.5
HC CONCENTRATION PPM	29
CO CONCENTRATION PPM	104
CO2 CONCENTRATION PCT	.89
NOX CONCENTRATION PPM	34.2
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	1.13
CO MASS (GRAMS)	8.12
CO2 MASS (GRAMS)	1095.24
NOX MASS (GRAMS)	3.81
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	1.28 (2.06)
CO GRAMS/KM (GRAMS/MILE)	9.18 (14.77)
CO2 GRAMS/KM (GRAMS/MILE)	1238 (1991)
NOX GRAMS/KM (GRAMS/MILE)	4.30 (6.92)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)

HC GRAMS/KG OF FUEL	3.23	HC GRAMS/MIN	.27
CO GRAMS/KG OF FUEL	23.2	CO GRAMS/MIN	1.9
CO2 GRAMS/KG OF FUEL	3123	CO2 GRAMS/MIN	256
NOX GRAMS/KG OF FUEL	10.86	NOX GRAMS/MIN	.89
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 53.61 (4.39)

TOTAL CVS FLOW= 67.2STD. CU. METRES

TABLE G-16. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/10/79 TIME -0 HRS. TEST NO. 5
MODEL 1975 CHEV C-60 ECSA CRUN-2 BAG-4 21C ENGINE 5.7 LITHEV 8
DRIVER KEN TEST WT. 7711 KG. GVW 0 KG
WET BULB TEMP 16 C DRY BULB TEMP 27 C REL. HUM. 29.2 PCT
SPEC. HUM. 6.4 GRAM/KG BARO. 749.3 MM HG. MEASURED FUEL 0.00 KG
DISTANCE 3.395 KM FUEL 738.2 G/LITRE FUEL HC RATIO 1.860

RUN DURATION	9.69 MINUTES
BLOWER INLET PRESS.	375.9 MM. H2O
BLOWER DIF. PRESS.	403.9 MM H2O
BLOWER INLET TEMP.	66 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5256
BLOWER CU. CM /REV.	17031

BAG RESULTS

HC SAMPLE METER READING/SCALE	23.3/ 2
HC SAMPLE PPM	23
HC BACKGRD METER READING/SCALE	9.6/ 2
HC BACKGRD PPM	10
CO SAMPLE METER READING/SCALE	87.1/11
CO SAMPLE PPM	421
CO BACKGRD METER READING/SCALE	.8/11
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	50.4/ 2
CO2 SAMPLE PERCENT	2.30
CO2 BACKGRD METER READING/SCALE	1.2/ 2
CO2 BACKGRD PERCENT	.04
NOX SAMPLE METER READING/SCALE	90.4/ 2
NOX SAMPLE PPM	90.4
NOX BACKGRD METER READING/SCALE	.6/ 2
NOX BACKGRD PPM	.6
HC CONCENTRATION PPM	15
CO CONCENTRATION PPM	396
CO2 CONCENTRATION PCT	2.27
NOX CONCENTRATION PPM	89.9
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	.65
CO MASS (GRAMS)	33.83
CO2 MASS (GRAMS)	3047.09
NOX MASS (GRAMS)	11.05
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	.19	(.31)
CO GRAMS/KM (GRAMS/MILE)	9.96	(16.03)
CO2 GRAMS/KM (GRAMS/MILE)	898	(1444)
NOX GRAMS/KM (GRAMS/MILE)	3.25	(5.24)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	.66	HC GRAMS/MIN	.14
CO GRAMS/KG OF FUEL	34.6	CO GRAMS/MIN	7.3
CO2 GRAMS/KG OF FUEL	3113	CO2 GRAMS/MIN	657
NOX GRAMS/KG OF FUEL	11.28	NOX GRAMS/MIN	2.38
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 34.00 (6.93)

TOTAL CVS FLOW= 23.4STD. CU. METRES

TABLE G-17. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/10/78 TIME -0 HRS. TEST NO. 5
MODEL 1975 CHEV C-60 ECSWCRUN-2 BAG-7 21C ENGINE 5.7 LITREV 8
DRIVER KEN TEST WT. 7711 KG. GVW 0 KG
WET BULB TEMP 16 C DRY BULB TEMP 27 C REL. HUM. 27.2 PCT
SPEC. HUM. 6.2 GRAM/KG BARO. 749.3 MM HG. MEASURED FUEL 0.00 KG
DISTANCE 1.883 KM FUEL 738.2 G/LITRE FUEL HC RATIO 1.860

RUN DURATION 9.80 MINUTES
BLOWER INLET PRESS. 375.9 MM. H20
BLOWER DIF. PRESS. 911.5 MM H20
BLOWER INLET TEMP. 39 DEG. C
DYNO REVOLUTIONS -0
BLOWER REVOLUTIONS 5929
BLOWER CU. CM /REV. 16978

BAG RESULTS

HC SAMPLE METER READING/SCALE	47.8/ 2
HC SAMPLE PPM	98
HC BACKGRD METER READING/SCALE	8.2/ 2
HC BACKGRD PPM	8
CO SAMPLE METER READING/SCALE	47.7/12
CO SAMPLE PPM	105
CO BACKGRD METER READING/SCALE	.7/12
CO BACKGRD PPM	1
CO2 SAMPLE METER READING/SCALE	66.9/ 3
CO2 SAMPLE PERCENT	1.20
CO2 BACKGRD METER READING/SCALE	2.5/ 3
CO2 BACKGRD PERCENT	.04
NOX SAMPLE METER READING/SCALE	32.8/ 2
NOX SAMPLE PPM	32.8
NOX BACKGRD METER READING/SCALE	.4/ 2
NOX BACKGRD PPM	.4
HC CONCENTRATION PPM	90
CO CONCENTRATION PPM	100
CO2 CONCENTRATION PCT	1.17
NOX CONCENTRATION PPM	32.4
SO2 CONCENTRATION PPM	0.0
HC MASS (GRAMS)	1.93
CO MASS (GRAMS)	9.68
CO2 MASS (GRAMS)	1769.67
NOX MASS (GRAMS)	4.97
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	1.02 (	1.65)
CO GRAMS/KM (GRAMS/MILE)	5.14 (	8.27)
CO2 GRAMS/KM (GRAMS/MILE)	940 (	1513)
NOX GRAMS/KM (GRAMS/MILE)	2.64 (	3.82)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (	0.00)

HC GRAMS/KG OF FUEL	3.91	HC GRAMS/MIN	.20
CO GRAMS/KG OF FUEL	17.1	CO GRAMS/MIN	2.0
CO2 GRAMS/KG OF FUEL	3132	CO2 GRAMS/MIN	364
NOX GRAMS/KG OF FUEL	7.81	NOX GRAMS/MIN	.93
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 40.61 (5.79)

TOTAL CVS FLOW= 82.9STD. CU. METRES

TABLE G-18. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/10/78 TIME -0 HRS. TEST NO. 5
MODEL 1975 CHEV C-60 FCS#CRUN-2 BAG-B 21C ENGINE 5.7 LITREV 8
DRIVER KEN TEST WT. 7211 KG. GVW 0 KG
WET BULB TEMP 16 C DRY BULB TEMP 27 C REL. HUM. 27.2 PCT
SPEC. HUM. 4.2 GRAM/KG BARO. 749.3 MM HG. MEASURED FUEL 0.00 KG
DISTANCE 5.922 KM FUEL 738.2 G/LITRE FUEL HC RATIO 1.860

RUN DURATION	9.98 MINUTES
BLOWER INLET PRESS.	901.3 MM. H2O
BLOWER DIF. PRESS.	931.8 MM H2O
BLOWER INLET TEMP.	76 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5052
BLOWER CU. CM /REV.	16994

BAG RESULTS

HC SAMPLE METER READING/SCALE	38.2/ 2
HC SAMPLE PPM	38
HC BACKGRD METER READING/SCALE	11.1/ 2
HC BACKGRD PPM	11
CO SAMPLE METER READING/SCALE	88.9/ 3
CO SAMPLE PPM	2490
CO BACKGRD METER READING/SCALE	.1/ 3
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	82.1/ 2
CO2 SAMPLE PERCENT	4.35
CO2 BACKGRD METER READING/SCALE	1.7/ 2
CO2 BACKGRD PERCENT	.06
NOX SAMPLE METER READING/SCALE	54.0/ 3
NOX SAMPLE PPM	162.0
NOX BACKGRD METER READING/SCALE	.4/ 3
NOX BACKGRD PPM	1.2
HC CONCENTRATION PPM	31
CO CONCENTRATION PPM	2240
CO2 CONCENTRATION PCT	4.31
NOX CONCENTRATION PPM	161.2
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	1.21
CO MASS (GRAMS)	177.74
CO2 MASS (GRAMS)	5372.47
NOX MASS (GRAMS)	18.28
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	.22 (	.36)
CO GRAMS/KM (GRAMS/MILE)	32.78 (	52.74)
CO2 GRAMS/KM (GRAMS/MILE)	991 (	1594)
NOX GRAMS/KM (GRAMS/MILE)	3.37 (	5.42)
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (	0.00)

HC GRAMS/KG OF FUEL	.63	HC GRAMS/MIN	.27
CO GRAMS/KG OF FUEL	99.6	CO GRAMS/MIN	39.7
CO2 GRAMS/KG OF FUEL	3011	CO2 GRAMS/MIN	1199
NOX GRAMS/KG OF FUEL	10.24	NOX GRAMS/MIN	4.08
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 44.52 (5.28)

TOTAL CVS FLOW= 68.2STD. CU. METRES

TABLE G-19. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/ 9/78 TIME -0 HRS. TEST NO. 6
MODEL 1975 CHEV C-60 ECSWCHRN-1 BAG-1 21M ENGINE 5.7 LITREV 8
DRIVER KEN TEST WT. 7711 KG. GVW 0 KG
WET BULB TEMP 12 C DRY BULB TEMP 26 C REL. HUM. 16.3 PCT
SPEC. HUM. 3.3 GRAM/KG BARO. 748.5 MM HG. MEASURED FUEL 0.00 KG
DISTANCE 1.883 KM FUEL 738.2 G/LITRE FUEL MC RATIO 1.860

RUN DURATION	4.26 MINUTES
BLOWER INLET PRESS.	358.1 MM. H20
BLOWER DIF. PRESS.	388.6 MM H20
BLOWER INLET TEMP.	40 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5372
BLOWER CU. CM /REV.	16971

BAG RESULTS

HC SAMPLE METER READING/SCALE	68.4/ 2
HC SAMPLE PPM	68
HC BACKGRD METER READING/SCALE	10.5/ 2
HC BACKGRD PPM	10
CO SAMPLE METER READING/SCALE	58.3/12
CO SAMPLE PPM	130
CO BACKGRD METER READING/SCALE	.4/12
CO BACKGRD PPM	1
CO2 SAMPLE METER READING/SCALE	67.4/ 3
CO2 SAMPLE PERCENT	1.21
CO2 BACKGRD METER READING/SCALE	2.9/ 3
CO2 BACKGRD PERCENT	.04
NOX SAMPLE METER READING/SCALE	39.2/ 2
NOX SAMPLE PPM	39.2
NOX BACKGRD METER READING/SCALE	1.0/ 2
NOX BACKGRD PPM	1.0
HC CONCENTRATION PPM	59
CO CONCENTRATION PPM	126
CO2 CONCENTRATION PCT	1.17
NOX CONCENTRATION PPM	38.3
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	2.75
CO MASS (GRAMS)	11.85
CO2 MASS (GRAMS)	1739.17
NOX MASS (GRAMS)	4.78
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	1.46 (2.35)	
CO GRAMS/KM (GRAMS/MILE)	6.30 (10.13)	
CO2 GRAMS/KM (GRAMS/MILE)	924 (1486)	
NOX GRAMS/KM (GRAMS/MILE)	2.54 (4.08)	
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)	
HC GRAMS/KG OF FUEL	4.44	HC GRAMS/MIN .58
CO GRAMS/KG OF FUEL	21.3	CO GRAMS/MIN 2.5
CO2 GRAMS/KG OF FUEL	3120	CO2 GRAMS/MIN 365
NOX GRAMS/KG OF FUEL	8.57	NOX GRAMS/MIN 1.00
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN 0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 40.05 (5.87)

TOTAL CVS FLOW= 41.2STD. CU. METERS

TABLE G-20. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/ 9/78 TIME -0 HRS. TEST NO. 6
MODEL 1975 CHEV C-60 ECS-CRUN-1 HAG-2 PIM ENGINE 5.7 LITREV 8
DRIVER KEN TEST WT. 2721 KG. GVW 0 KG
WET BULB TEMP 12 C DRY BULB TEMP 26 C REL. HUM. 19.6 PCT
SPEC. HUM. 3.1 GRAM/KG BARO. 298.5 MM HG. MEASURED FUEL 0.00 KG
DISTANCE 5.922 KM FUEL 738.2 G/LITRE FUEL MC RATIO 1.860

RUN DURATION	9.97	MINUTES
BLOWER INLET PRESS.	916.6	MM. H20
BLOWER DIF. PRESS.	999.6	MM H20
BLOWER INLET TEMP.	76	DEG. C
DYNO REVOLUTIONS	-0	
BLOWER REVOLUTIONS	5090	
BLOWER CU. CM /REV.	1.9978	

BAG RESULTS

HC SAMPLE METER READING/SCALE	22.9/ 2
HC SAMPLE PPM	23
HC BACKGRD METER READING/SCALE	12.2/ 2
HC BACKGRD PPM	12
CO SAMPLE METER READING/SCALE	67.3/ 3
CO SAMPLE PPM	1735
CO BACKGRD METER READING/SCALE	.1/ 2
CO BACKGRD PPM	9
CO2 SAMPLE METER READING/SCALE	83.2/ 2
CO2 SAMPLE PERCENT	9.93
CO2 BACKGRD METER READING/SCALE	1.5/ 2
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	52.5/ 3
NOX SAMPLE PPM	157.5
NOX BACKGRD METER READING/SCALE	.3/ 3
NOX BACKGRD PPM	.9
HC CONCENTRATION PPM	15
CO CONCENTRATION PPM	1577
CO2 CONCENTRATION PCT	9.39
NOX CONCENTRATION PPM	156.9
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	.58
CO MASS (GRAMS)	129.36
CO2 MASS (GRAMS)	5999.81
NOX MASS (GRAMS)	16.25
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	.11	(.17)
CO GRAMS/KM (GRAMS/MILE)	22.93	(36.90)
CO2 GRAMS/KM (GRAMS/MILE)	1009	(1616)
NOX GRAMS/KM (GRAMS/MILE)	3.00	(4.82)
SO2 GRAMS/KM (GRAMS/MILE)	0.00	(0.00)

HC GRAMS/KG OF FUEL	.33	HC GRAMS/MIN	.13
CO GRAMS/KG OF FUEL	69.9	CO GRAMS/MIN	27.8
CO2 GRAMS/KG OF FUEL	3059	CO2 GRAMS/MIN	1217
NOX GRAMS/KG OF FUEL	9.13	NOX GRAMS/MIN	3.63
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 99.91 (5.30)

TOTAL CVS FLOW 57.685TD. CU. METRES

TABLE G-21. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/ 9/74	TIME -0 HRS.	TEST NO. 6
MODEL 1975 CHEV C-60 ECS#CRUN-1 BAG-3 21M		ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 7711 KG.	GVW 0 KG
WET BULB TEMP 12 C	DRY BULB TEMP 27 C	REL. HUM. 13.1 PCT
SPEC. HUM. 2.9 GRAM/KG	BARO. 298.5 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE .869 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	9.23 MINUTES
BLOWER INLET PRESS.	337.8 MM. H2O
BLOWER DIF. PRESS.	375.9 MM H2O
BLOWER INLET TEMP.	65 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	4298
BLOWER CU. CM /REV.	17057

BAG RESULTS		
HC	SAMPLE METER READING/SCALE	98.3/ 2
HC	SAMPLE PPM	98
HC	BACKGRD METER READING/SCALE	11.9/ 2
HC	BACKGRD PPM	12
CO	SAMPLE METER READING/SCALE	22.9/13
CO	SAMPLE PPM	21
CO	BACKGRD METER READING/SCALE	1.9/13
CO	BACKGRD PPM	1
CO2	SAMPLE METER READING/SCALE	51.7/ 3
CO2	SAMPLE PERCENT	.90
CO2	BACKGRD METER READING/SCALE	3.9/ 3
CO2	BACKGRD PERCENT	.05
NOX	SAMPLE METER READING/SCALE	37.5/ 2
NOX	SAMPLE PPM	37.5
NOX	BACKGRD METER READING/SCALE	1.6/ 2
NOX	BACKGRD PPM	1.6
HC	CONCENTRATION PPM	37
CO	CONCENTRATION PPM	69
CO2	CONCENTRATION PCT	.85
NOX	CONCENTRATION PPM	36.0
SO2	CONCENTRATION PPM	0.0
HC	MASS (GRAMS)	1.95
CO	MASS (GRAMS)	5.39
CO2	MASS (GRAMS)	1051.69
NOX	MASS (GRAMS)	3.69
SO2	MASS (GRAMS)	0.00

HC	GRAMS/KM (GRAMS/MILE)	1.67 (2.69)		
CO	GRAMS/KM (GRAMS/MILE)	6.21 (9.99)		
CO2	GRAMS/KM (GRAMS/MILE)	1210 (1947)		
NOX	GRAMS/KM (GRAMS/MILE)	4.25 (6.84)		
SO2	GRAMS/KM (GRAMS/MILE)	0.00 (0.00)		
HC	GRAMS/KG OF FUEL 9.32		HC GRAMS/MIN	.39
CO	GRAMS/KG OF FUEL 16.1		CO GRAMS/MIN	1.3
CO2	GRAMS/KG OF FUEL 3130		CO2 GRAMS/MIN	298
NOX	GRAMS/KG OF FUEL 10.99		NOX GRAMS/MIN	.87
SO2	GRAMS/KG OF FUEL 0.00		SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 52.30 (9.50)

TOTAL CVS FLOW 62.6STD. CU. METRES

TABLE G-22. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/ 9/78 TIME -0 HRS. TEST NO. 6
MODEL 1975 CHEV C-60 ECS=CRUN-1 BAG-1 21M ENGINE 5.7 LITREV 8
DRIVER KEN TEST WT. 7711 KG. GVW 0 KG
WET BULB TEMP 13 C DRY BULB TEMP 28 C REL. HUM. 12.7 PCT
SPEC. HUM. 3.0 GRAM/KG BARO. 748.5 MM HG. MEASURED FUEL 0.00 KG
DISTANCE 3.911 KM FUEL 738.2 G/LITRE FUEL HC RATIO 1.860

RUN DURATION 9.68 MINUTES
BLOWER INLET PRESS. 375.9 MM. H20
BLOWER DIF. PRESS. 908.9 MM H20
BLOWER INLET TEMP. 42 DEG. C
DYNO REVOLUTIONS -0
BLOWER REVOLUTIONS 5289
BLOWER CU. CM /REV. 17036

BAG RESULTS

HC	SAMPLE METER READING/SCALE	25.6/ 2
HC	SAMPLE PPM	26
HC	BACKGRD METER READING/SCALE	9.9/ 2
HC	BACKGRD PPM	9
CO	SAMPLE METER READING/SCALE	81.8/11
CO	SAMPLE PPM	329
CO	BACKGRD METER READING/SCALE	.7/11
CO	BACKGRD PPM	2
CO2	SAMPLE METER READING/SCALE	99.5/ 2
CO2	SAMPLE PERCENT	2.25
CO2	BACKGRD METER READING/SCALE	1.6/ 2
CO2	BACKGRD PERCENT	.06
NOX	SAMPLE METER READING/SCALE	34.1/ 3
NOX	SAMPLE PPM	102.3
NOX	BACKGRD METER READING/SCALE	.2/ 3
NOX	BACKGRD PPM	.6
HC	CONCENTRATION PPM	18
CO	CONCENTRATION PPM	360
CO2	CONCENTRATION PCT	2.21
NOX	CONCENTRATION PPM	101.8
SO2	CUCENTRATION PPM	0.0
HC	MASS (GRAMS)	.77
CO	MASS (GRAMS)	31.25
CO2	MASS (GRAMS)	3015.11
NOX	MASS (GRAMS)	11.58
SO2	MASS (GRAMS)	0.00

HC	GRAMS/KM (GRAMS/MILE)	.22 (.36)
CO	GRAMS/KM (GRAMS/MILE)	9.16 (14.74)
CO2	GRAMS/KM (GRAMS/MILE)	849 (1922)
NOX	GRAMS/KM (GRAMS/MILE)	3.39 (5.46)
SO2	GRAMS/KM (GRAMS/MILE)	0.00 (0.00)

HC	GRAMS/KG OF FUEL	.79	HC GRAMS/MIN .16
CO	GRAMS/KG OF FUEL	32.3	CO GRAMS/MIN 6.7
CO2	GRAMS/KG OF FUEL	3116	CO2 GRAMS/MIN 644
NOX	GRAMS/KG OF FUEL	11.97	NOX GRAMS/MIN 2.47
SO2	GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN 0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 38.37 (6.13)

TOTAL CVS FLOW 24.2STD. CU. METRES

TABLE G-23. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 1/ 9/78	TIME -0 HRS.	TEST NO. 6
MODEL 1975 CHEV C-60 ECSH	CHUN-S BAG-1 21M	ENGINE 5.7 LITREV 8
DRIVER KEN	TEST WT. 3211 KG.	GVW 0 KG
WET BULB TEMP 12 C	DRY BULB TEMP 24 C	REL. HUM. 18.8 PCT
SPEC. HUM. 3.5 GRAM/KG	BARO. 748.3 MM HG.	MEASURED FUEL 0.00 KG
DISTANCE 1.866 KM	FUEL 738.2 G/LITRE	FUEL HC RATIO 1.860

RUN DURATION	9.28 MINUTES
BLOWER INLET PRESS.	375.9 MM. H2O
BLOWER DIF. PRESS.	919.0 MM H2O
BLOWER INLET TEMP.	31 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5399
BLOWER CU. CM /REV.	16825

BAG RESULTS

HC SAMPLE METER READING/SCALE	48.9/ 2
HC SAMPLE PPM	89
HC BACKGRD METER READING/SCALE	8.5/ 2
HC BACKGRD PPM	9
CO SAMPLE METER READING/SCALE	51.5/12
CO SAMPLE PPM	119
CO BACKGRD METER READING/SCALE	.1/12
CO BACKGRD PPM	0
CO2 SAMPLE METER READING/SCALE	87.7/ 3
CO2 SAMPLE PERCENT	1.22
CO2 BACKGRD METER READING/SCALE	3.5/ 3
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	39.3/ 2
NOX SAMPLE PPM	39.3
NOX BACKGRD METER READING/SCALE	.9/ 2
NOX BACKGRD PPM	.9
HC CONCENTRATION PPM	81
CO CONCENTRATION PPM	110
CO2 CONCENTRATION PCT	1.17
NOX CONCENTRATION PPM	38.9
SO2 COCENTRATION PPM	0.0
HC MASS (GRAMS)	3.89
CO MASS (GRAMS)	10.65
CO2 MASS (GRAMS)	1776.06
NOX MASS (GRAMS)	4.95
SO2 MASS (GRAMS)	0.00

HC GRAMS/KM (GRAMS/MILE)	2.08 (3.35)		
CO GRAMS/KM (GRAMS/MILE)	5.71 (9.18)		
CO2 GRAMS/KM (GRAMS/MILE)	952 (1531)		
NOX GRAMS/KM (GRAMS/MILE)	2.67 (4.30)		
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)		
HC GRAMS/KG OF FUEL	6.82	HC GRAMS/MIN	.81
CO GRAMS/KG OF FUEL	18.7	CO GRAMS/MIN	2.2
CO2 GRAMS/KG OF FUEL	3118	CO2 GRAMS/MIN	372
NOX GRAMS/KG OF FUEL	8.76	NOX GRAMS/MIN	1.04
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 11.28 (5.20)

TOTAL CVS FLOW 83.0810. CU. METRES

TABLE G-24. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 12/ 9/78	TIME -0 HRS.		TEST NO. 6
MODEL 1975 CHEV C-60 ECSeC	RUN-3 BAG-2 21M		ENGINE 5.7 LITHEV 8
DRIVER KEN	TEST WT. 7211 KG.		GVW 0 KG
WET BULB TEMP 12 C	DRY BULB TEMP 24 C		REL. HUM. 19.6 PCT
SPEC. HUM. 3.1 GRAM/KG	BARO. 748.3 MM HG.		MEASURED FUEL 0.00 KG
DISTANCE 5.358 KM	FUEL 738.2 G/LITHE		FUEL HC RATIO 1.860

RUN DURATION	9.50 MINUTES
BLOWER INLET PRESS.	903.9 MM. H20
BLOWER DIF. PRESS.	936.9 MM H20
BLOWER INLET TEMP.	71 DEG. C
DYNO REVOLUTIONS	-0
BLOWER REVOLUTIONS	5090
BLOWER CU. CM /REV.	1899

BAG RESULTS

HC	SAMPLE METER READING/SCALE	99.8/ 2
HC	SAMPLE PPM	95
HC	BACKGRD METER READING/SCALE	8.1/ 2
HC	BACKGRD PPM	8
CO	SAMPLE METER READING/SCALE	61.9/ 3
CO	SAMPLE PPM	1568
CO	BACKGRD METER READING/SCALE	.2/ 3
CO	BACKGRD PPM	5
CO2	SAMPLE METER READING/SCALE	79.0/ 2
CO2	SAMPLE PERCENT	9.13
CO2	BACKGRD METER READING/SCALE	1.5/ 2
CO2	BACKGRD PERCENT	.05
NOX	SAMPLE METER READING/SCALE	62.7/ 3
NOX	SAMPLE PPM	188.1
NOX	BACKGRD METER READING/SCALE	.1/ 3
NOX	BACKGRD PPM	.3
HC	CONCENTRATION PPM	39
CO	CONCENTRATION PPM	1933
CO2	CONCENTRATION PCT	9.09
NOX	CONCENTRATION PPM	187.9
SO2	CONCENTRATION PPM	0.0
HC	MASS (GRAMS)	1.58
CO	MASS (GRAMS)	116.22
CO2	MASS (GRAMS)	5215.37
NOX	MASS (GRAMS)	20.02
SO2	MASS (GRAMS)	0.00

HC	GRAMS/KM (GRAMS/MILE)	.29 (	.47)
CO	GRAMS/KM (GRAMS/MILE)	21.69 (	34.90)
CO2	GRAMS/KM (GRAMS/MILE)	973 (	1566)
NOX	GRAMS/KM (GRAMS/MILE)	3.74 (	6.01)
SO2	GRAMS/KM (GRAMS/MILE)	0.00 (	0.00)

HC	GRAMS/KG OF FUEL .93	HC	GRAMS/MIN .35
CO	GRAMS/KG OF FUEL 68.2	CO	GRAMS/MIN 25.8
CO2	GRAMS/KG OF FUEL 3059	CO2	GRAMS/MIN 1158
NOX	GRAMS/KG OF FUEL 11.74	NOX	GRAMS/MIN 4.44
SO2	GRAMS/KG OF FUEL 0.00	SO2	GRAMS/MIN 0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 93.09 (5.93)

TOTAL CVS FLOW 89.2870. CU. METERS

TABLE G-25. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 5/ 9/79 TIME 09 HRS. TEST NO. 4
MODEL 1978 CHEV C-60 ECS=CRUN=3 BAG=3 2IN ENGINE 5.7 LITHEV 8
DRIVER KEN TEST WT. 7211 LBS. GVW 0 KG
WET BULB TEMP 19 C DRY BULB TEMP 27 C REL. HUM. 16.7 PCT
SPEC. HUM. 3.8 GRAMS/KG BARO. 748.0 MM HG. MEASURED FUEL 0.00 KG
DISTANCE .053 KM FUEL 738.2 G/LITRE FUEL MC RATIO 1.860

RUN DURATION 9.22 MINUTES
BLOWER INLET PRESS. 348.9 MM. H2O
BLOWER DIF. PRESS. 375.0 MM H2O
BLOWER INLET TEMP. 64 DEG. F
DYNO REVOLUTIONS 0
BLOWER REVOLUTIONS 9788
BLOWER CU. CM /REV. 17062

BAG RESULTS

HC	SAMPLE METER READING/SCALE	92.6/ 2
HC	SAMPLE PPM	93
HC	BACKGRD METER READING/SCALE	11.2/ 2
HC	BACKGRD PPM	11
CO	SAMPLE METER READING/SCALE	82.9/13
CO	SAMPLE PPM	82
CO	BACKGRD METER READING/SCALE	1.3/13
CO	BACKGRD PPM	1
CO2	SAMPLE METER READING/SCALE	51.6/ 3
CO2	SAMPLE PERCENT	.48
CO2	BACKGRD METER READING/SCALE	8.7/ 3
CO2	BACKGRD PERCENT	.09
NOX	SAMPLE METER READING/SCALE	98.9/ 2
NOX	SAMPLE PPM	98.9
NOX	BACKGRD METER READING/SCALE	.6/ 2
NOX	BACKGRD PPM	.6
HC	CONCENTRATION PPM	92
CO	CONCENTRATION PPM	79
CO2	CONCENTRATION PCT	.84
NOX	CONCENTRATION PPM	98.8
SO2	CONCENTRATION PPM	0.0
HC	MASS (GRAMS)	1.25
CO	MASS (GRAMS)	6.81
CO2	MASS (GRAMS)	1059.81
NOX	MASS (GRAMS)	9.19
SO2	MASS (GRAMS)	0.00

HC	GRAMS/KM (GRAMS/MILE)	1.96 (3.15)
CO	GRAMS/KM (GRAMS/MILE)	7.28 (11.71)
CO2	GRAMS/KM (GRAMS/MILE)	1243 (2000)
NOX	GRAMS/KM (GRAMS/MILE)	4.91 (7.90)
SO2	GRAMS/KM (GRAMS/MILE)	0.00 (0.00)

HC	GRAMS/KG OF FUEL	3.68	HC GRAMS/MIN	.90
CO	GRAMS/KG OF FUEL	18.9	CO GRAMS/MIN	1.5
CO2	GRAMS/KG OF FUEL	3129	CO2 GRAMS/MIN	251
NOX	GRAMS/KG OF FUEL	12.36	NOX GRAMS/MIN	.99
SO2	GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 53.73 (4.38)

TOTAL CVS FLOW 67.6910. CU. METERS

TABLE G-26. EXHAUST EMISSIONS FROM SINGLE BAG SAMPLE
VEHICLE NUMBER 20

DATE 11/ 9/78 TIME 00 HRS. TEST NO. 6
MODEL 1978 CHEV C-60 ECS=CHUG-D BAG=0 DIM ENGINE 5.7 LITHEV 8
DRIVER KEN TEST WT. 2721 KG. GVW 0 KG
WET BULB TEMP 19 C DRY BULB TEMP 30 C REL. HUM. 19.0 PCT
SPEC. HUM. 3.2 GRAM/KG BARO. 748.0 MM HG. MEASURED FUEL 0.00 KG
DISTANCE 3.329 KM FUEL 738.8 G/LITRE FUEL MC RATIO 1.866

RUN DURATION 9.67 MINUTES
BLOWER INLET PRESS. 378.5 MM. H20
BLOWER DIF. PRESS. 911.8 MM H20
BLOWER INLET TEMP. 67 DEG. F
DYNO REVOLUTIONS 0
BLOWER REVOLUTIONS 5277
BLOWER CU. CM /REV. 12022

BAG RESULTS

MC SAMPLE METER READING/SCALE	24.3/ 2
MC SAMPLE PPM	29
MC BACKGRD METER READING/SCALE	12.9/ 2
MC BACKGRD PPM	12
CO SAMPLE METER READING/SCALE	82.3/11
CO SAMPLE PPM	383
CO BACKGRD METER READING/SCALE	.5/11
CO BACKGRD PPM	2
CO2 SAMPLE METER READING/SCALE	98.9/ 2
CO2 SAMPLE PERCENT	2.19
CO2 BACKGRD METER READING/SCALE	1.3/ 2
CO2 BACKGRD PERCENT	.05
NOX SAMPLE METER READING/SCALE	33.2/ 3
NOX SAMPLE PPM	99.6
NOX BACKGRD METER READING/SCALE	.3/ 3
NOX BACKGRD PPM	.9
MC CONCENTRATION PPM	14
CO CONCENTRATION PPM	369
CO2 CONCENTRATION PCT	2.15
NOX CONCENTRATION PPM	98.8
SO2 CONCENTRATION PPM	0.0
MC MASS (GRAMS)	.59
CO MASS (GRAMS)	31.09
CO2 MASS (GRAMS)	2885.85
NOX MASS (GRAMS)	11.09
SO2 MASS (GRAMS)	0.00

MC GRAMS/KM (GRAMS/MILE)	.17 (.28)			
CO GRAMS/KM (GRAMS/MILE)	9.19 (14.78)			
CO2 GRAMS/KM (GRAMS/MILE)	859 (1374)			
NOX GRAMS/KM (GRAMS/MILE)	3.28 (5.28)			
SO2 GRAMS/KM (GRAMS/MILE)	0.00 (0.00)			
MC GRAMS/KG OF FUEL	.69	MC GRAMS/MIN	.13
CO GRAMS/KG OF FUEL	33.5	CO GRAMS/MIN	6.6
CO2 GRAMS/KG OF FUEL	3115	CO2 GRAMS/MIN	618
NOX GRAMS/KG OF FUEL	11.97	NOX GRAMS/MIN	2.39
SO2 GRAMS/KG OF FUEL	0.00	SO2 GRAMS/MIN	0.00

CARBON BALANCE FUEL ECONOMY L/100KM (MILES/GALLON) 27.09 (8.69)

TOTAL CVS FLOW 28.2STD. CU. METERS

TABLE G-27. VEHICLE EMISSION RESULTS

1978 LIGHT DUTY EMISSIONS TEST

ACTUAL DISTANCES USED IN CALCULATIONS

UNIT NO. 20 TEST NO. 8-2 DATE 1/10/78 MFGR. CODE -0 YR. 1975
VEHICLE MODEL CHEV C-60 ECSWC ENGINE 5.7? LITRE 8 CURB WT. 0 KG GVM 0 KG

BAROMETER 796.76 MM OF HG.
DRY BULB TEMP. 23.3 DEG. C
REL. HUMIDITY 29 PCT.

WET BULB TEMP 12.2 DEG. C
ABS. HUMIDITY 9.3 GRAMS/KG
COMMENTS

EXHAUST EMISSIONS

BLOWER INLET PRESS., G1 388.6 MM. H2O
BLOWER INLET TEMP. 69 DEG. C

BLOWER DIF. PRESS., G2, 929.2 MM. H2O

BAG RESULTS

BAG NO.	1	2	3
BLOWER REVOLUTIONS	9557	16317	9521
HC SAMPLE METER READING/SCALE	29.5/ 3	82.2/ 2	11.3/ 3
HC SAMPLE PPM	295	82	113
HC BACKGRD METER READING/SCALE	1.0/ 3	12.2/ 2	1.1/ 3
HC BACKGRD PPM	10	12	11
CO SAMPLE METER READING/SCALE	67.5/ 3	93.5/12	22.6/ 3
CO SAMPLE PPM	1792	230	522
CO BACKGRD METER READING/SCALE	.2/ 3	.5/12	.1/ 3
CO BACKGRD PPM	5	1	2
CO2 SAMPLE METER READING/SCALE	59.7/ 2	88.0/ 3	53.0/ 2
CO2 SAMPLE PERCENT	2.55	1.69	2.95
CO2 BACKGRD METER READING/SCALE	1.9/ 2	3.5/ 3	1.5/ 2
CO2 BACKGRD PERCENT	.05	.05	.05
NOX SAMPLE METER READING/SCALE	36.8/ 3	62.6/ 2	98.9/ 3
NOX SAMPLE PPM	110.9	62.6	195.2
NOX BACKGRD METER READING/SCALE	.2/ 3	.9/ 2	.2/ 3
NOX BACKGRD PPM	.6	.9	.6
SO2 SAMPLE METER READING/SCALE	-0.0/-0	-0.0/-0	-0.0/-0
SO2 SAMPLE PPM	-0.0	-0.0	-0.0
SO2 BACKGRD METER READING/SCALE	-0.0/-0	-0.0/-0	-0.0/-0
SO2 BACKGRD PPM	-0.0	-0.0	-0.0
HC CONCENTRATION PPM	287	72	109
CO CONCENTRATION PPM	1639	220	491
CO2 CONCENTRATION PCT	2.51	1.59	2.91
NOX CONCENTRATION PPM	109.9	61.8	193.7
SO2 CONCENTRATION PPM	0.0	0.0	0.0
HC MASS GRAMS	22.09	9.90	7.98
CO MASS GRAMS	254.68	58.95	76.09
CO2 MASS GRAMS	6192.39	6832.06	5868.07
NOX MASS GRAMS	23.16	22.29	30.38
SO2 MASS GRAMS	0.00	0.00	0.00
HC GRAMS/KM (GRAMS/MILE)	3.91 (6.30)	1.51 (2.42)	1.41 (2.27)
CO GRAMS/KM (GRAMS/MILE)	45.12 (72.60)	9.36 (15.06)	13.49 (21.63)
CO2 GRAMS/KM (GRAMS/MILE)	1088.2 (1751.0)	1062.3 (1709.3)	1037.3 (1669.0)
NOX GRAMS/KM (GRAMS/MILE)	4.10 (6.60)	3.56 (5.73)	5.37 (8.64)
FUEL CONSUMPTION BY CB L/100KM (MPG)	50.00 (4.70)	96.17 (5.09)	95.36 (5.19)
CVS FLOW STD. CU. METRES (SCF)	133.5 (4713.1)	227.9 (8047.7)	133.0 (4695.5)
CALCULATED DISTANCE KM(MILES)	5.69 (3.51)	6.29 (3.88)	5.66 (3.52)

WEIGHTED FUEL CONSUMPTION LITRES/100KM (MPG)	96.79 (5.03)
WEIGHTED MASS HC GRAMS/KM (GRAMS/MILE)	1.97 (3.17)
WEIGHTED MASS CO GRAMS/KM (GRAMS/MILE)	17.77 (28.59)
WEIGHTED MASS CO2 GRAMS/KM (GRAMS/MILE)	1060.8 (1706.9)
WEIGHTED MASS NOX GRAMS/KM (GRAMS/MILE)	4.16 (6.70)

TOTAL CVS FLOW = 999.9 STD. CU. METRES

TABLE G-28. VEHICLE EMISSION RESULTS

1978 LIGHT DUTY EMISSIONS TEST

ACTUAL DISTANCES USED IN CALCULATIONS

UNIT NO. 20 TEST NO. B-3 DATE 1/11/78

VEHICLE MODEL CHEV C-60 ECSNC ENGINE 5.74 LITRE 8 MFGR. CODE -0 YR. 1975

CURB WT. 0 KG GVM 0 KG

BAROMETER 796.51 MM OF HG.

DRY BULB TEMP. 27.8 DEG. C

REL. HUMIDITY 23 PCT.

WET BULB TEMP 15.0 DEG. C

ABS. HUMIDITY 5.4 GRAMS/KG

COMMENTS

EXHAUST EMISSIONS

BLOWER DIF. PRESS., G2, 931.8 MM. H20

BLOWER INLET PRESS., G1 393.7 MM. H20

BLOWER INLET TEMP. 62 DEG. C

BAG RESULTS	1	2	3
BAG NO.	1	2	3
BLOWER REVOLUTIONS	9521	16309	9518
HC SAMPLE METER READING/SCALE	24.4/ 3	10.0/ 3	12.2/ 3
HC SAMPLE PPM	244	100	122
HC BACKGRD METER READING/SCALE	1.3/ 3	1.2/ 3	1.1/ 3
HC BACKGRD PPM	13	12	11
CO SAMPLE METER READING/SCALE	57.3/ 3	81.2/12	31.0/ 3
CO SAMPLE PPM	1931	188	726
CO BACKGRD METER READING/SCALE	.2/ 3	.7/12	.3/ 3
CO BACKGRD PPM	5	1	7
CO2 SAMPLE METER READING/SCALE	55.0/ 2	87.2/ 3	53.6/ 2
CO2 SAMPLE PERCENT	2.57	1.62	2.99
CO2 BACKGRD METER READING/SCALE	1.4/ 2	3.8/ 3	1.5/ 2
CO2 BACKGRD PERCENT	.05	.06	.05
NOX SAMPLE METER READING/SCALE	92.4/ 3	65.0/ 2	92.6/ 3
NOX SAMPLE PPM	128.7	65.0	127.8
NOX BACKGRD METER READING/SCALE	.3/ 3	.6/ 2	.3/ 3
NOX BACKGRD PPM	.9	.6	.9
SO2 SAMPLE METER READING/SCALE	-0.0/-0	-0.0/-0	-0.0/-0
SO2 SAMPLE PPM	-0.0	-0.0	-0.0
SO2 BACKGRD METER READING/SCALE	-0.0/-0	-0.0/-0	-0.0/-0
SO2 BACKGRD PPM	-0.0	-0.0	-0.0
HC CONCENTRATION PPM	239	89	113
CO CONCENTRATION PPM	1396	180	680
CO2 CONCENTRATION PCT	2.53	1.57	2.95
NOX CONCENTRATION PPM	128.0	64.5	127.1
SO2 CONCENTRATION PPM	0.0	0.0	0.0
HC MASS GRAMS	17.99	11.80	8.70
CO MASS GRAMS	209.21	92.90	105.71
CO2 MASS GRAMS	6186.82	6565.80	5979.98
NOX MASS GRAMS	27.78	23.96	27.57
SO2 MASS GRAMS	0.00	0.00	0.00
HC GRAMS/KM (GRAMS/MILE)	3.21 (5.17)	1.88 (3.03)	1.54 (2.48)
CO GRAMS/KM (GRAMS/MILE)	37.35 (60.10)	7.69 (12.29)	18.70 (30.09)
CO2 GRAMS/KM (GRAMS/MILE)	1109.6 (1777.3)	1047.1 (1689.8)	1057.1 (1700.8)
NOX GRAMS/KM (GRAMS/MILE)	4.96 (7.98)	3.82 (6.15)	4.88 (7.85)
FUEL CONSUMPTION BY CB L/100KM (MPG)	50.09 (9.70)	95.96 (5.17)	96.58 (5.05)
CVS FLOW STD. CU. METRES (SCF)	133.5 (4719.1)	228.6 (8073.9)	133.9 (4712.3)
CALCULATED DISTANCE KM(MILES)	5.60 (3.48)	6.27 (3.90)	5.65 (3.51)

WEIGHTED FUEL CONSUMPTION LITRES/100KM (MPG)	96.20 (5.09)
WEIGHTED MASS HC GRAMS/KM (GRAMS/MILE)	2.06 (3.31)
WEIGHTED MASS CO GRAMS/KM (GRAMS/MILE)	16.66 (26.80)
WEIGHTED MASS CO2 GRAMS/KM (GRAMS/MILE)	1061.5 (1707.9)
WEIGHTED MASS NOX GRAMS/KM (GRAMS/MILE)	4.39 (6.98)

TOTAL CVS FLOW = 495.6 STD. CU. METRES